COAL AND ASHES HANDLING SYSTEMS FOR BOILER HOUSES

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INCLUDING

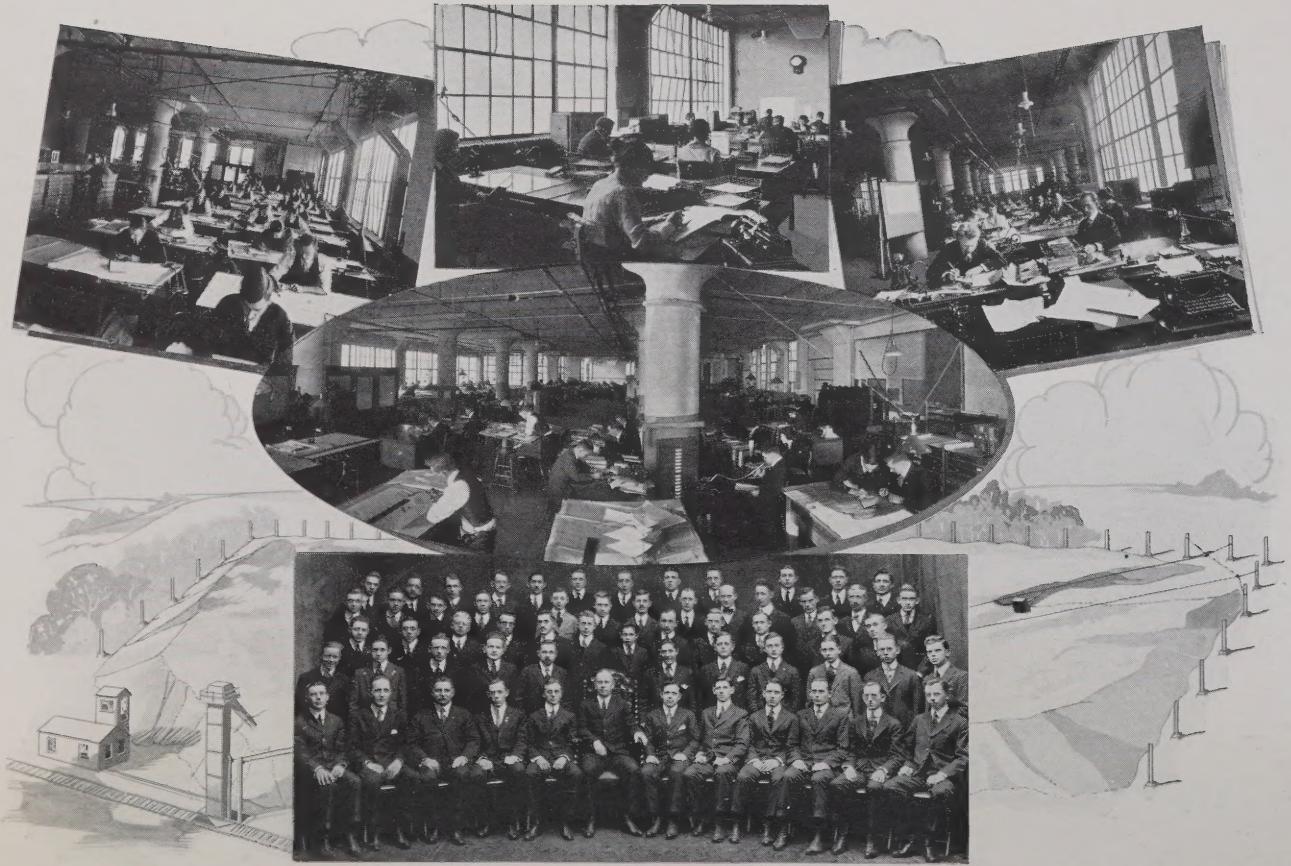
THE SKIP HOIST

COAL WEIGH LARRY

CABLE DRAG SCRAPER

CATALOG 50

BEAUMONT



The Beaumont Office Organization

Coal and Ashes Handling Systems for Boiler Houses

Complete Systems Including

The Skip Hoist
Cable Drag Scraper
Coal Weigh Larry

Steel Bunkers, Coal Crushers,
Coal and Ash Gates, etc.

Catalog No. 50

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R. H. Beaumont Co., Philadelphia
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IT is our belief that the average far-sighted executive is entirely willing to pay a fair price to obtain the kind of quality that ultimately more than saves its cost.

To design and build each Beaumont installation as well as is humanly possible has been the ideal of this organization since its founding.

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foreword

OUR entire organization is devoted to the building of equipment for handling coal and its two by-products, ashes and coke. By twenty years of concentration in this field we have developed certain machines as being the best for the purpose intended. These are standard and are described and illustrated herein.

Our work includes the erection of the equipment. One contract covers everything—design, construction and installation of the complete plant, including the necessary bunkers and structures.

Our experience is at your disposal when contemplating a new boiler house or when considering coal and ashes handling equipment in an existing one. Being the only concern specializing in this field, we are confident of being of real service to you.

Beaumont
ONE CONTRACT
ONE RESPONSIBILITY

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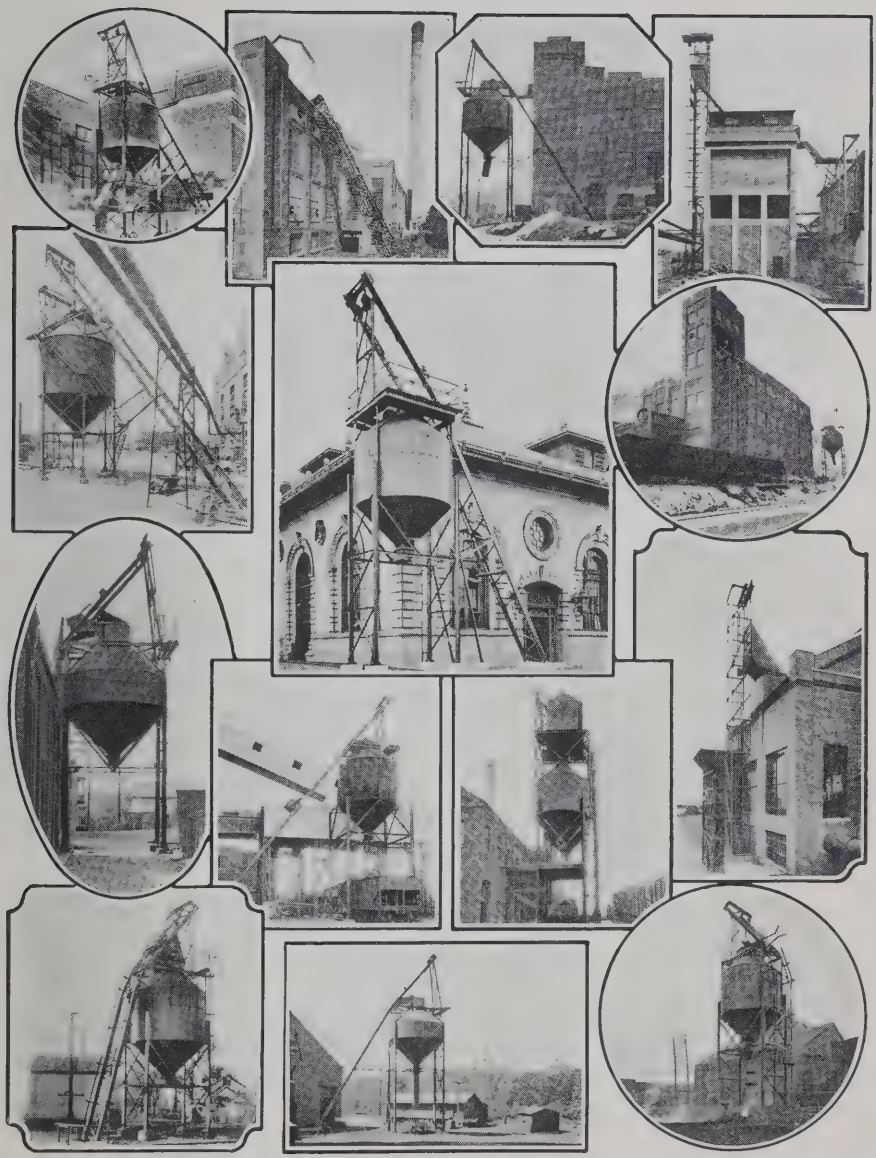
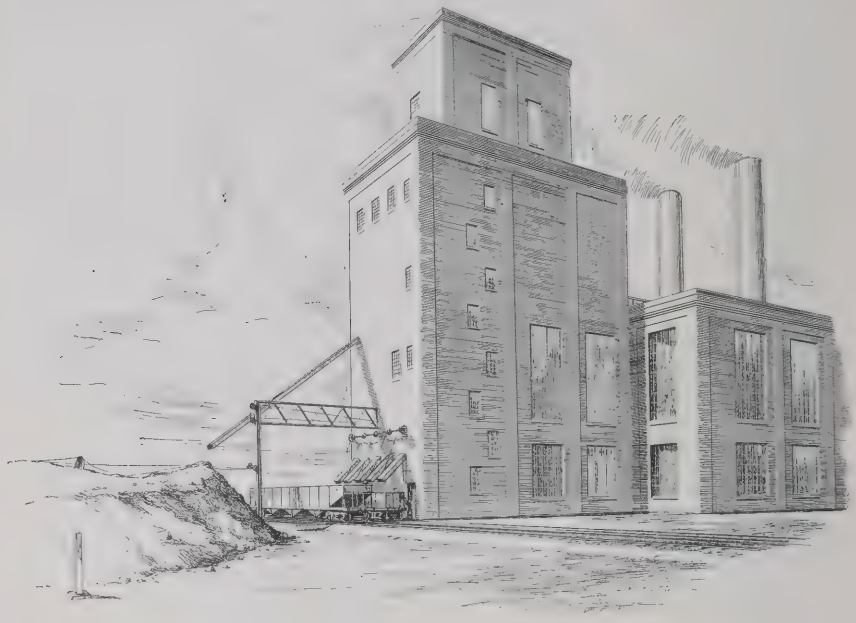


The Beaumont Skip Hoist



Super-Central Coal and Ash Handling System

IN this system of coal and ash handling the machinery is reduced to its simplest form and consists only of a few self-contained massive units.

One or two skip hoists elevate coal from railroad cars to the bunker and a separate skip hoist elevates ashes to the ash bunker. Coal is delivered to the boilers by a coal weigh larry; ashes are taken from the boilers by ash larries, and delivered to the ash skip hoist. Coal is stored outdoors and reclaimed by the cable drag scraper.

Both coal and ash bunkers, skip hoists and all machinery are housed in a separate building at the end of the boiler house.

The super-central system possesses the advantages of lower first cost, maintenance expense and power consumption; elimination of all chain conveyors and elevators; ease of construction; permits the use of the simplest type boiler house building with maximum light and ventilation; the boiler house construction is expedited; noiseless operation and pleasing architectural appearance.

Advantages of the Super-Central Coal and Ash Handling System

1. Lowest First Cost. A bunker of this type, where all the coal and ashes are concentrated at one spot and supported on but four columns, is the most economical to build. The usual distributing conveyor is eliminated, thus further reducing the cost. Construction costs are less. (See Advantage No. 4.)

2. Lowest Maintenance Expense. Because the machinery is reduced to a minimum, and that used is of rugged design. Having no distributing conveyor reduces maintenance cost.

3. Lowest Power Consumption. Because distributing conveyor is eliminated, and this (when used) consumes more power than the elevator.

4. Ease of Construction. Since all the work is done outside of the boiler house there is no interference with the operating men in the case of existing boiler houses, and in new boiler houses with the men erecting the building, boilers, stokers, piping, etc. This means that the cost to erect is less, due to no interference.

5. Simplest Type Building. May be built (in case of new boiler house) consisting of four walls and roof, standard building construction.

6. Construction Expedited. Building does not have to wait for data from firm furnishing bunker and machinery. Construction of building and bunker takes place simultaneously, instead of the latter waiting until the building is finished. Standard equipment can be quickly completed.

7. Maximum Light and Ventilation. No overhead bunkers to obstruct light and ventilation.

8. Eliminates Chain Elevators and Conveyors which are always subject to wreck and must be renewed more frequently and at a greater cost than skip hoists.

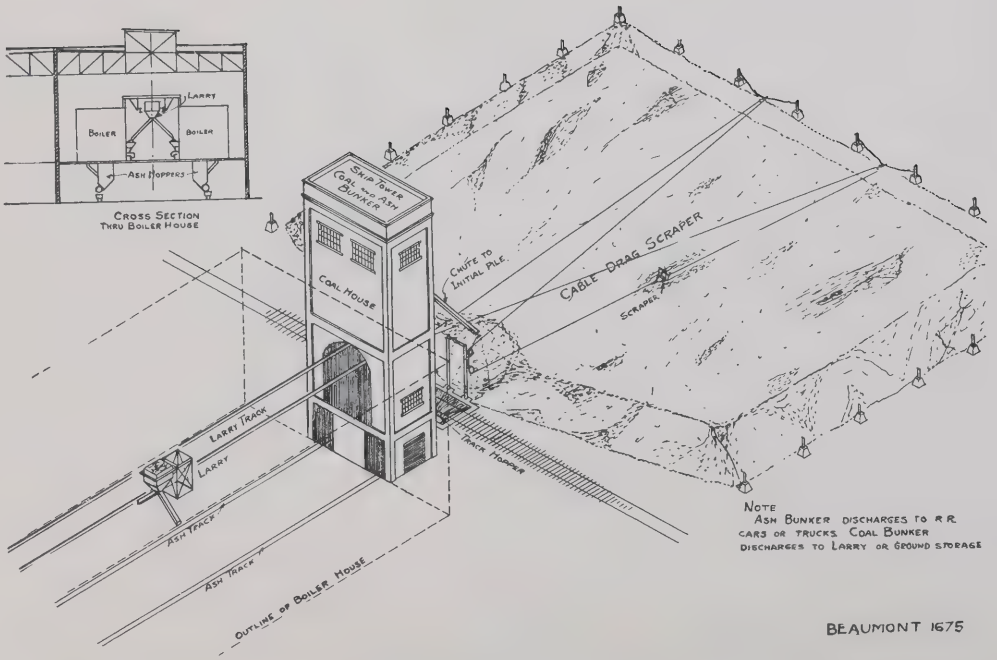
9. Machinery Operates with Minimum Noise. Some systems are extremely noisy and are especially undesirable in built-up districts. The skip hoist is as quiet as a freight elevator.

10. Pleasing Architectural Appearance. The bunker is blended with the building, making a very pleasing exterior appearance.

11. Readily Applied to Existing Plant. This arrangement may readily be applied to existing boiler houses at a comparatively low cost.

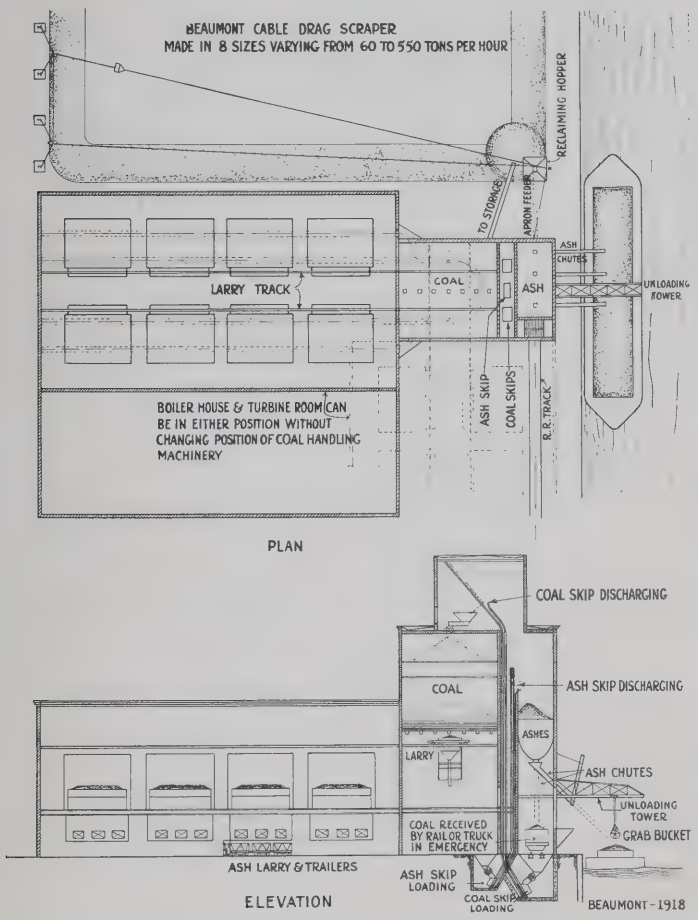
12. Adaptable to Pulverized Coal. If the future necessitates the use of pulverized coal the super-central system adapts itself readily. The entire coal and ash handling machinery, being in a separate structure, may be easily added to, as required. The firing aisle, being free and clear, lends itself to any pulverized coal burning method.

13. Future Extension to boiler house, turbine room and coal and ash handling system may easily be made with the super-central system. Two methods of extension are shown on the following pages.



Super-Central Coal and Ash Handling System

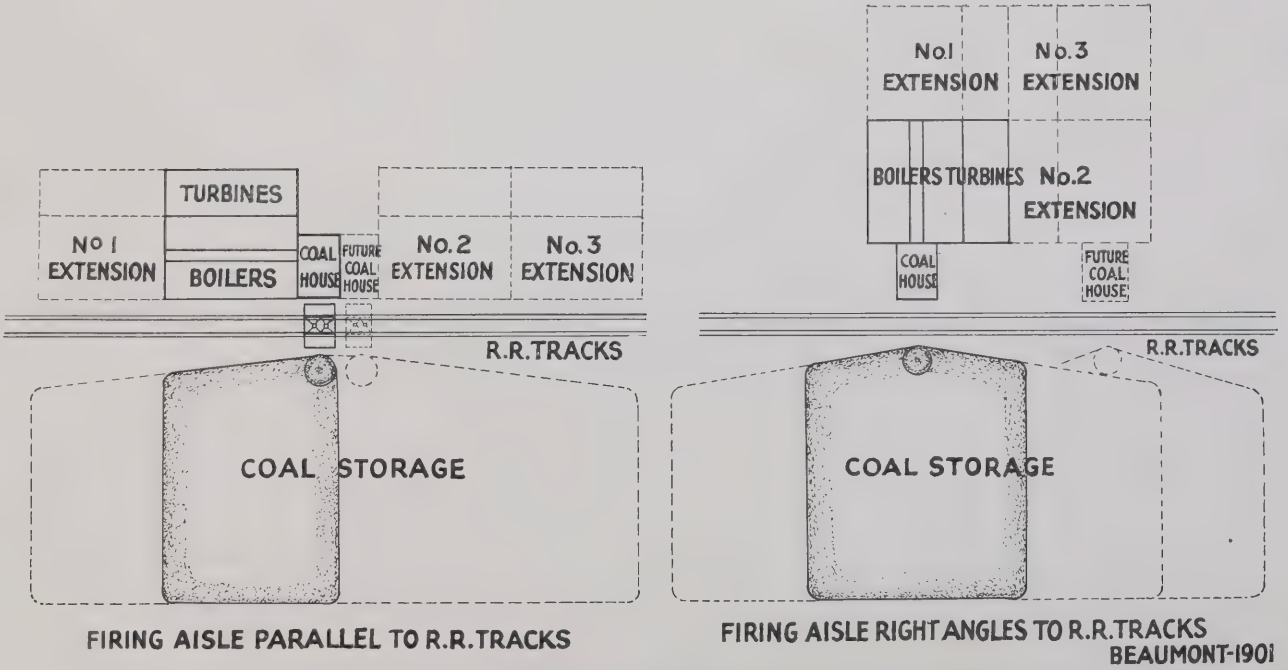
Machinery is reduced to its simplest form, the equipment consisting of only a few self-contained massive units. In moderate size boiler houses, two winding machines are used, placed side by side in a clean, well-lighted, accessible room in the coal house—one for skip hoist and one for drag scraper. There is very little machinery except these winding machines.



Waterside Super-Central System

Super-Central Coal and Ash Handling System

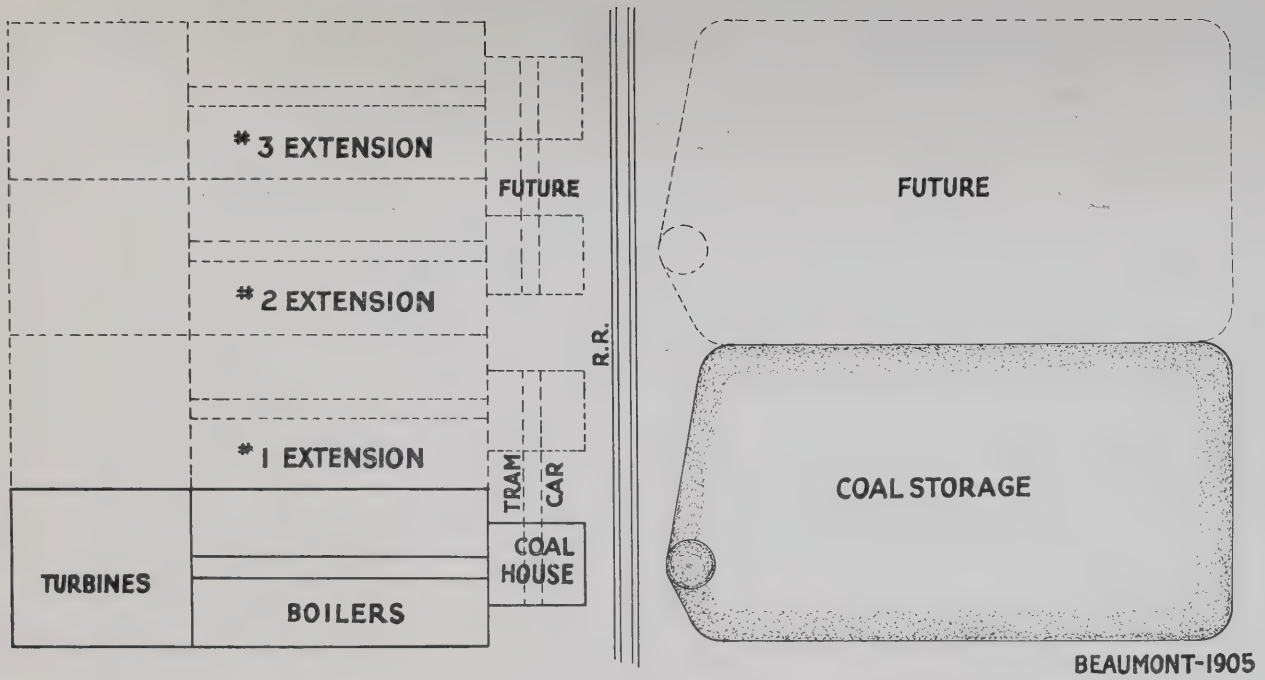
THE arrangement shown above possesses all the advantages given on page 7. It has an added advantage in that it uses a low barge unloading tower, which will give increased handling capacity without the use of excessively large grab bucket and hoisting engine. The tower operator's cage is close to the barge, so that he can clearly see the grab bucket at all times. This is particularly important, because of the fog and smoke usually along the water front, which at times make it impossible for an operator on a high unloading tower to see the barge.



Future Extension Made Easy with the Super-Central System

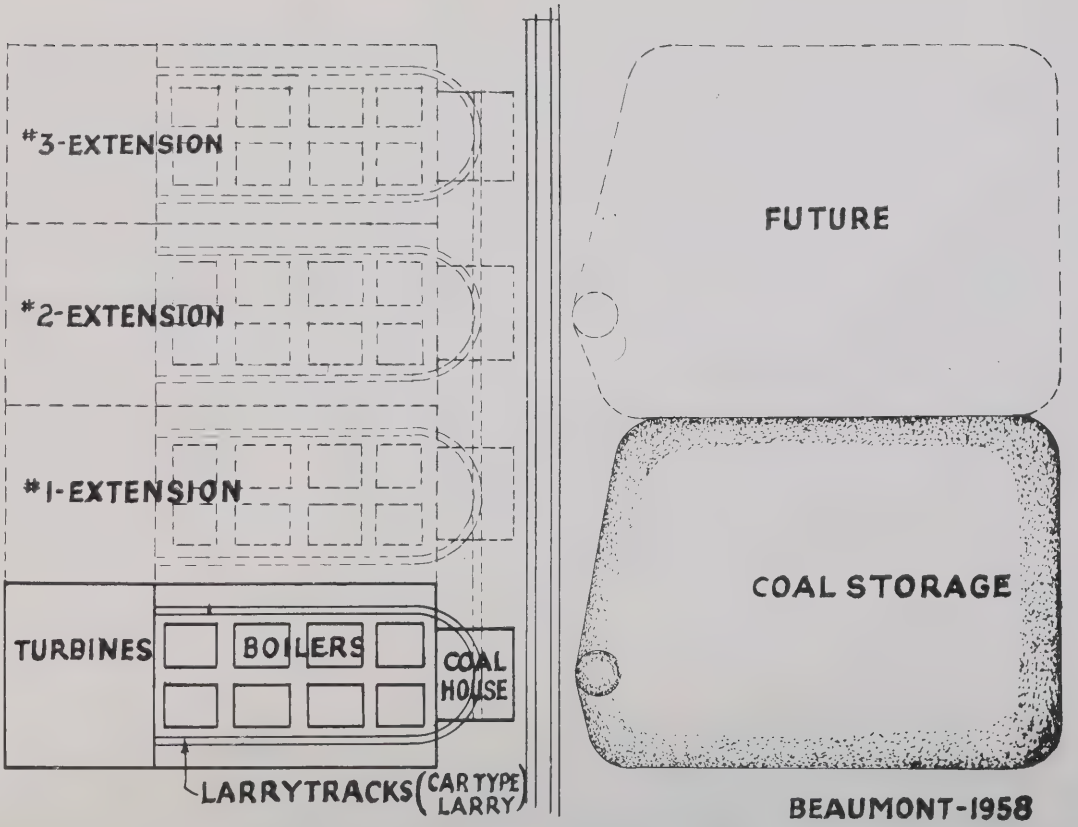
In the planning of a new power house, future growth must be provided for.

The super-central coal and ash handling system is built large enough initially to take care of Extension No. 1, shown above. In making this first extension only the larry tracks are extended, thus eliminating all expense of new machinery. Extensions No. 2 and No. 3 consist of a duplicate super-central unit with duplicate boiler house and turbine room, as shown by dotted lines.



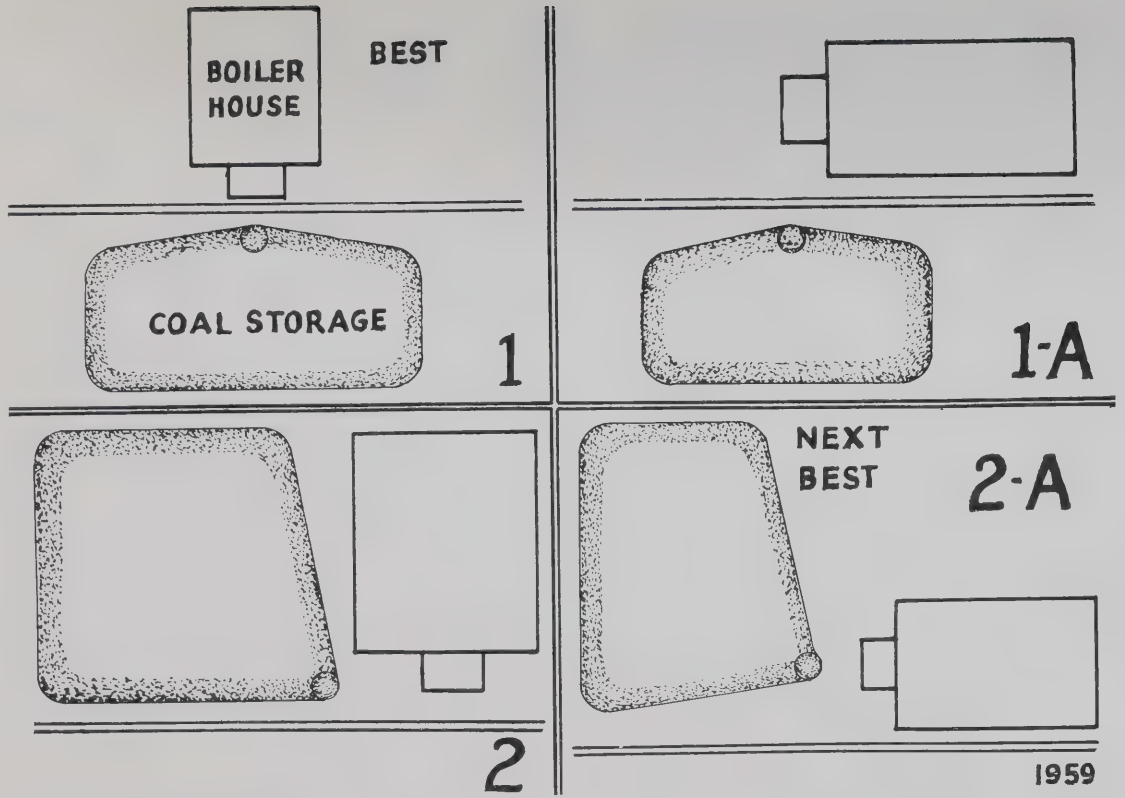
Possible Method of Extension

With this arrangement the coal and ash bunkers are only large enough to take care of the initial installation but the skip hoist capacities are made large enough to provide for Extension No. 1 also. When this extension is made, new coal and ash bunkers and larries are installed. Coal is taken from the coal skip over to the new coal bunker by a tram car.



Another Method of Extension

With this arrangement coal weigh larries of the car type are used permitting greater flexibility in operation. Boilers may be set either back to back as shown or with central firing aisle.



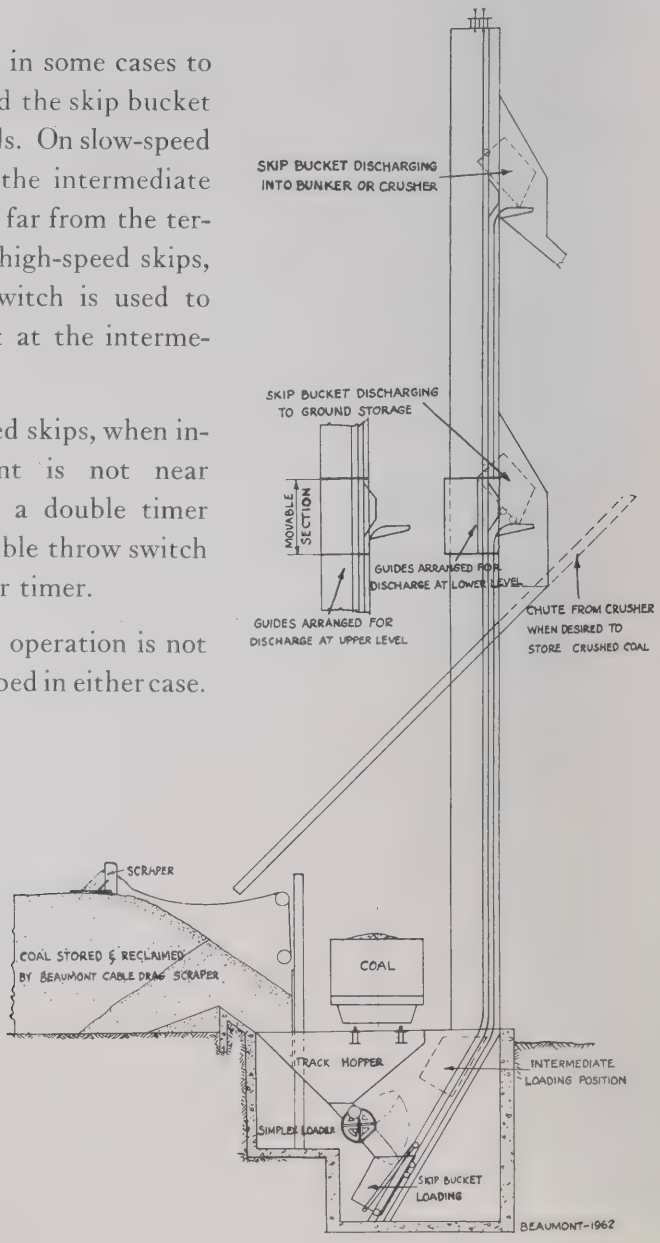
Four Standard Arrangements of Super-Central Coal and Ash Handling System

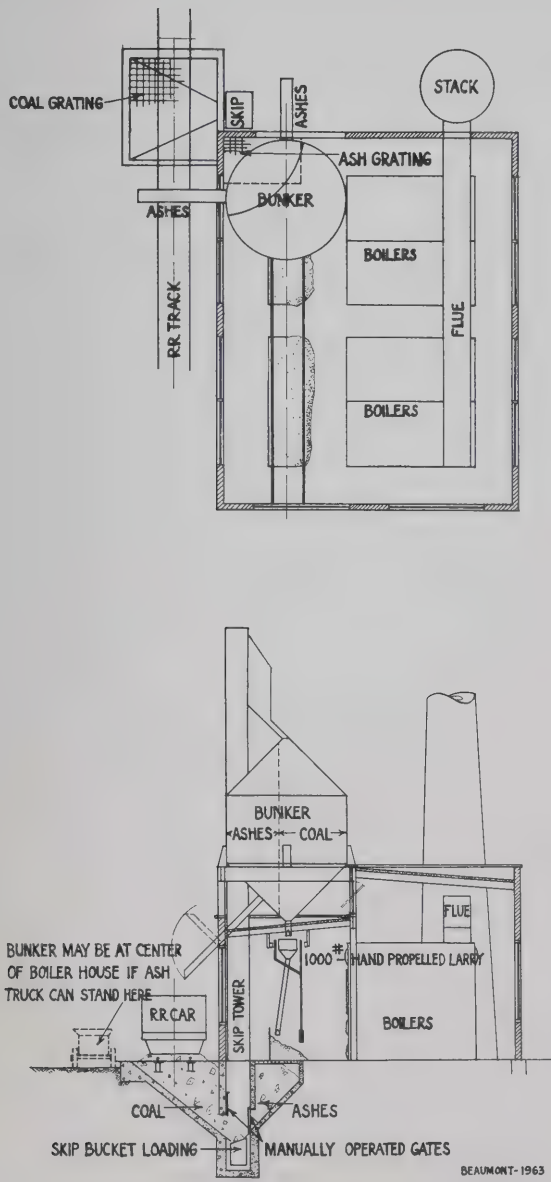
Skips with Intermediate Loading or Discharge Points

IT is desirable in some cases to dump or load the skip bucket at different levels. On slow-speed skips, or when the intermediate point is not too far from the terminal point on high-speed skips, a track limit switch is used to stop the bucket at the intermediate level.

On high-speed skips, when intermediate point is not near either terminal, a double timer is used with double throw switch to connect either timer.

The cycle of operation is not otherwise disturbed in either case.

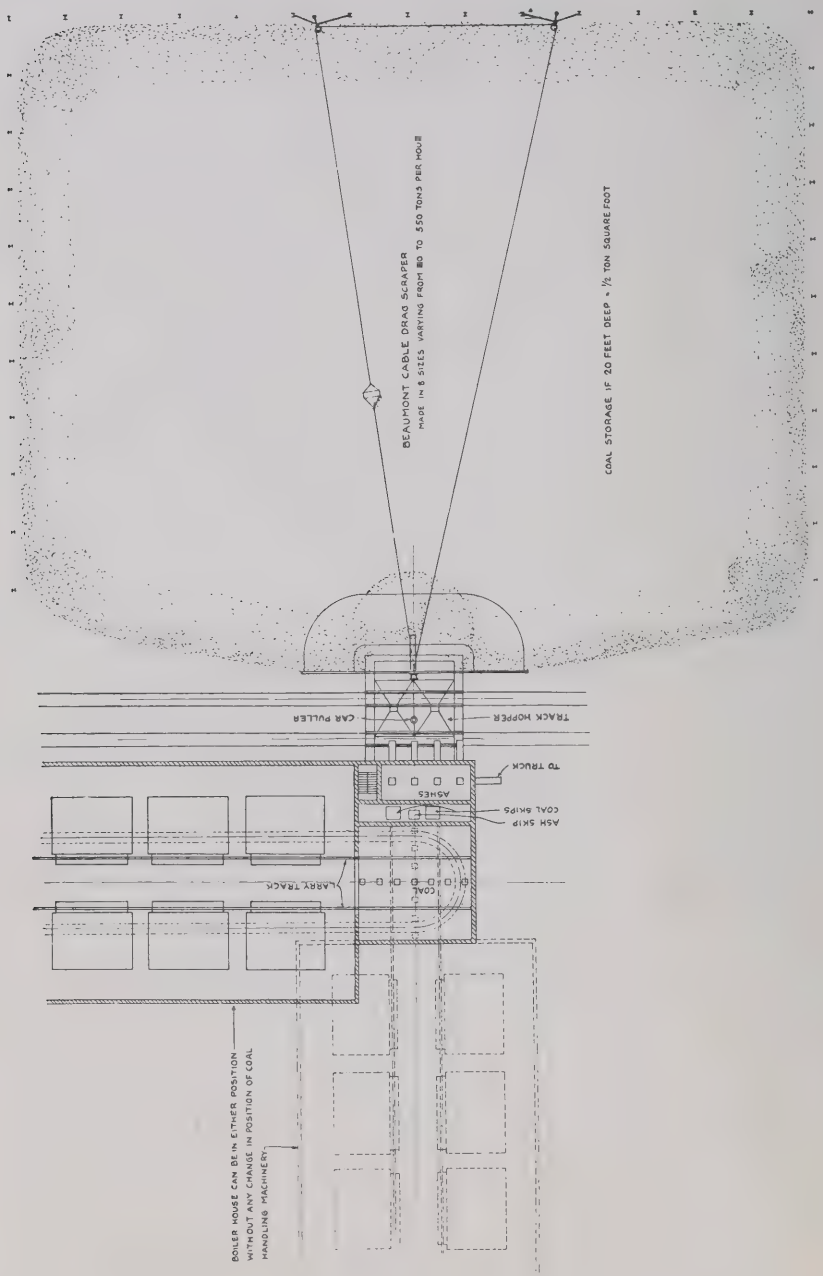

SKIP BUCKET DISCHARGING INTO BUNKER OR CRUSHER
SKIP BUCKET DISCHARGING TO GROUND STORAGE
MOVABLE SECTION
GUIDES ARRANGED FOR DISCHARGE AT LOWER LEVEL
GUIDES ARRANGED FOR DISCHARGE AT UPPER LEVEL
CHUTE FROM CRUSHER WHEN DESIRED TO STORE CRUSHED COAL
SCRAPER
COAL STORED & RECLAIMED BY BEAUMONT CABLE DRAG SCRAPER
COAL
TRACK HOPPER
INTERMEDIATE LOADING POSITION
SIMPLEX LOADER
SKIP BUCKET LOADING
BEAUMONT-1962



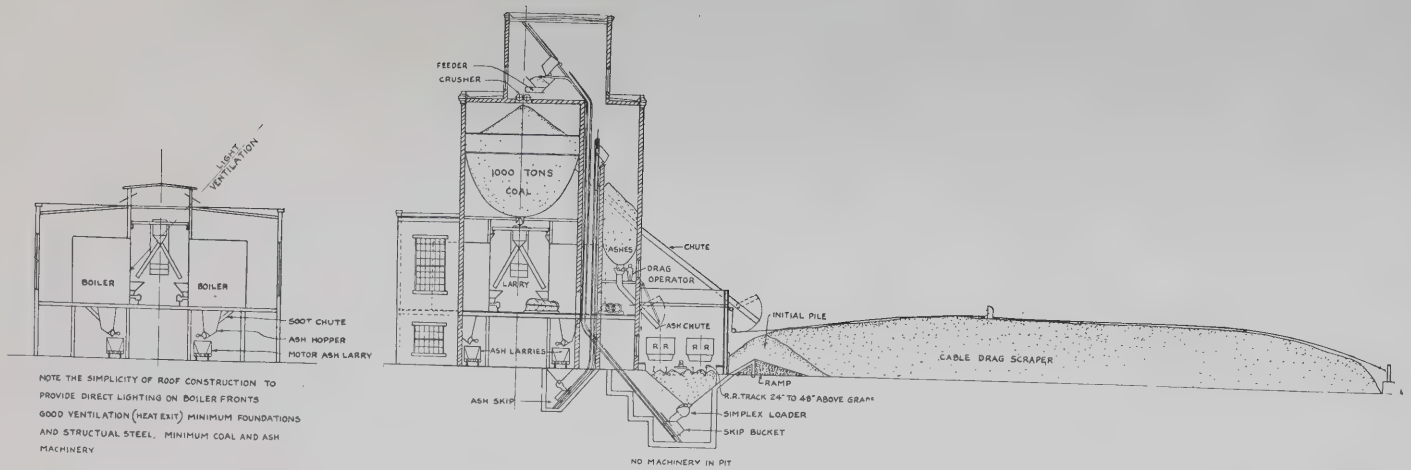
Super-Central Coal and Ash Handling System

With Single Manually Controlled Skip

For small hand or stoker fired plants the layout shown above possesses all the advantages listed on page 7. Single manually controlled skip, capacity 30 tons per hour, handles either coal or ashes, manually loaded.


BEAUMONT CABLE DRAG SCRAPER
MADE IN 8 SIZES VARYING FROM 150 TO 550 TONS PER HOUR
COAL STORAGE IF 20 FEET DEEP = ½ TON SQUARE FOOT
CAR PULLER
TRACK HOPPER
TO TRUCK
ASHES
COAL SHIPS
ASH SKIP
LARRY TRACK
COAL
BOILER HOUSE CAN BE IN EITHER POSITION WITHOUT ANY CHANGE IN POSITION OF COAL HANDLING MACHINERY

Plan

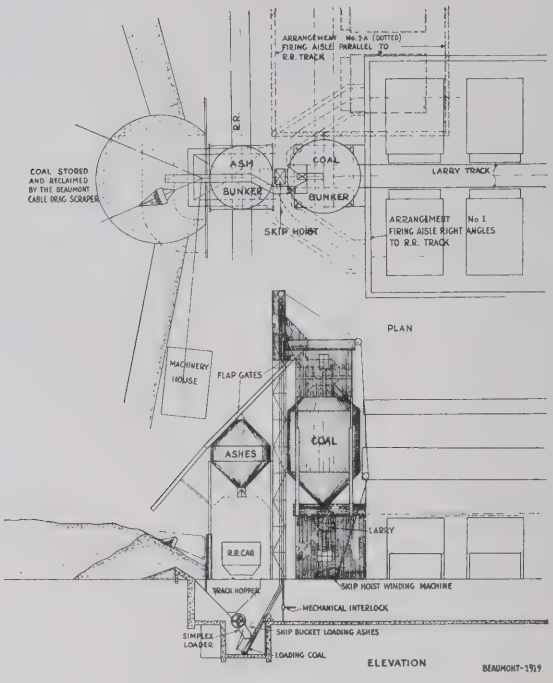


Super-Central Coal and Ash Handling System for 10,000 Boiler Horsepower Plant

The firing aisle of the boiler house may run parallel to the railroad track, or if desired it may run at right angles to the track. The system applies itself to either a double or single row of boilers.

Coal storage may be on the opposite side of the railroad track from the boiler house or it may be on the same side, as the property plan dictates.

The simplicity of this centralized coal and ash handling system is apparent after a study of the layouts above. The only machinery used is the winding machines, and these are rugged, self-contained units, housed in the coal house away from dust and dirt.



Coal Storage on Opposite Side of Railroad Track

Super-Central Coal and Ash Handling System

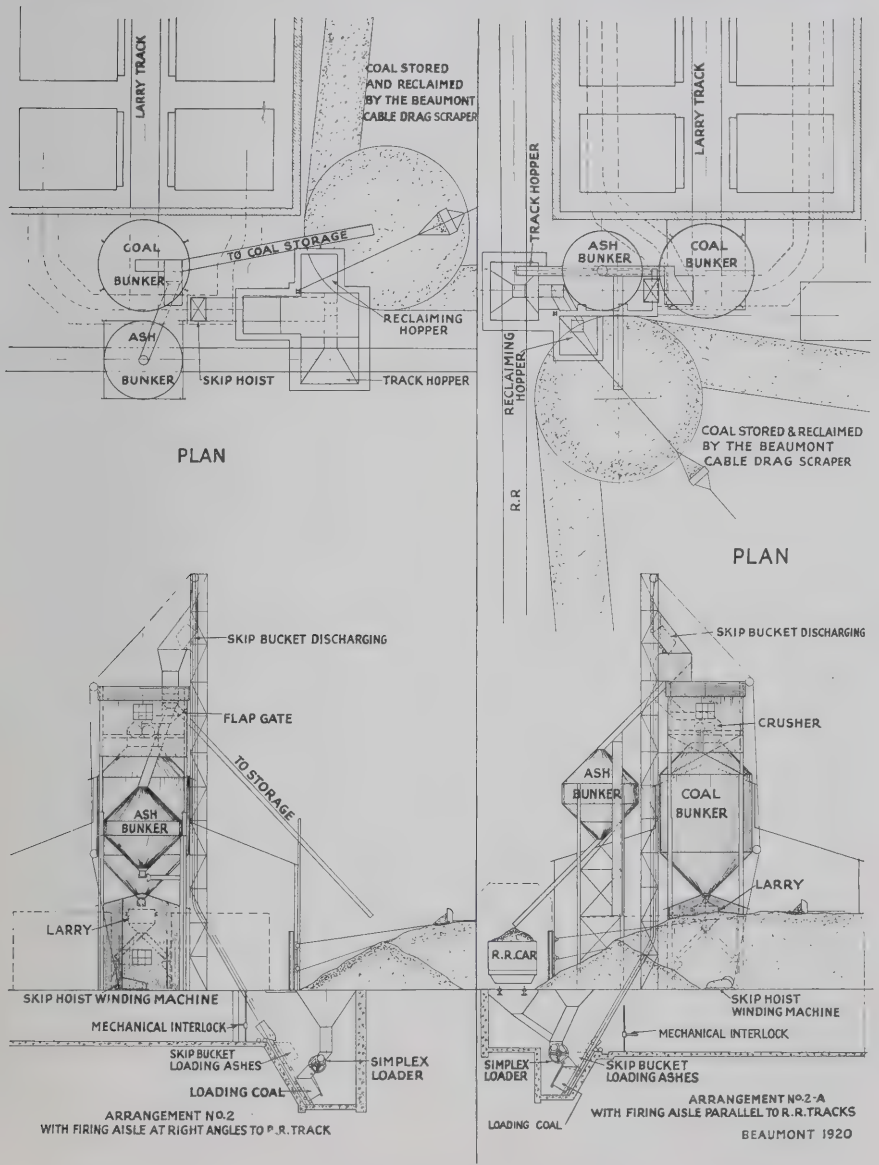
FOR smaller boiler houses the super-central coal and ash handling systems shown above and on the opposite page possess all the advantages of the large super-central system and are in economic proportion to the size of plant.

A single full automatic skip hoist handles both the coal and the ashes, an interlock being provided which prevents coal from getting into ash bunker, or *vice-versa*, and also prevents the handling of coal and ashes simultaneously. By locking in a push button the skip becomes a single cycle machine for handling ashes, the bucket stopping at the ash floor level after each trip until the button is unlocked.

Two cylindrical steel bunkers are used, one for coal the other for ashes. This arrangement may be readily applied to existing boiler houses at a comparatively low cost.

We recommend that crusher be raised sufficiently to permit the storage of crushed coal.

Super-Central Coal and Ash Handling System



Coal Storage on Same Side of Railroad

We recommend that crusher be raised sufficiently to permit the storage of crushed coal.

Why the Beaumont Skip Hoist?

WE recommend the use of the Beaumont Skip Hoist for handling both the coal and ashes at boiler houses. It is the simplest device made for any handling service, consisting only of a compact self-contained winding machine, one, or at the most, two, simple buckets and a piece of steel cable. It cannot be seriously wrecked, as only the cable is subject to appreciable wear, and this is not excessive.

High lift does not add stress in a skip as is the case with a chain elevator.

In connection with a larry, the skip hoist makes the ideal vertical-horizontal conveying unit. Both skip and larry are big, rugged units instead of hundreds of pins, rollers, links, cotters, etc., which compose a chain and bucket system. (An elevator-conveyor of the chain and bucket type 100 feet long and 40 feet high contains 775 pins, 775 rollers, 1550 links and washers, and 775 cotters.) When all these are cast or malleable iron (excepting pins and cotters) think what a chance for wreckage and wear to occur.

The only part of the skip hoist which comes into contact with the material is the bucket, and this is little affected. The winding machine, which is the only mechanical part of the equipment, is always located in a position remote from the skip, so that dust or dirt cannot reach it.

Beaumont Skip Hoists are built to handle up to 300 tons of coal an hour at a lift of 150 feet. For this service a chain and bucket elevator would not be practical.

The automatic Beaumont Skip Hoist requires no attendant, any of the men engaged in bringing coal cars to the boiler house can start the skip by pushing the starting button.

On account of the fewer and simpler parts going into the construction of the skip hoist, its installation cost is lower than other systems. As the skip runs only while doing work, its power consumption is low. Repairs and renewals are such that they can be readily made at the plant, eliminating the necessity of carrying an expensive stock of special replacement parts.

With the skip hoist and external bunker, if the coal in the bunker ignites it can readily be quenched by hoisting water in the skip bucket and discharging it onto the burning coal. This is impossible with a long bunker and distributing conveyor.

Advantages of the Beaumont Skip Hoist

1. Entirely Automatic. The bucket is loaded automatically, ascends, discharges, returns, and again reloads, repeating this cycle without any attention until stopped.

2. Skip Bucket is of the turn-over type, insuring a clean discharge. The shaft to which the bucket is attached is a through shaft fastened securely to the underside of the skip bucket and not hung on stud pins as some buckets are. All buckets are equipped with hollow wheels packed with oil waste.

3. The Cable is 8-strand, 19-wire plough steel with hemp centre, giving great flexibility and therefore longer life. A steel cable does not wear out from tensile stress alone but by weakening under bending strains.

4. Sheaves on the Beaumont Skip Hoist are cast steel throughout and of large diameter, so that cable bending stresses are at a minimum.

5. The Winding Machine has cut spur gears operating in oil in a fully enclosed housing. The hoisting drum has machine turned grooves.

6. Safety Features include the following:

(*a*) Shoe type magnetic brake is applied to the extended motor shaft on the winding machine. This device will hold the bucket at any point in its travel in case of accidental current failure.

(*b*) Slack cable switch at the hoist drum, which will stop the skip hoist instantly if the cable should become slack from any cause.

(*c*) Track limit safety switches are provided at the top of the bucket travel and at the top and bottom of the counterweight travel. These switches will stop the skip hoist should the bucket or counterweight travel beyond their designed stopping point.

(*d*) Safety protection switches are placed at the top and bottom of the skip bucket runway so that the workman can cut off the current while working at these points.

(*e*) Adjustable cable take-up on all counterweighted and balanced skips.

(*f*) Automatic cable take-up (linked bale) on all automatically loaded buckets.

(*g*) Mechanical interlock on single skips used for both coal and ashes, which prevents coal getting into ash bunker and *vice-versa*, and electrical overflow switch which stops the skip in case of an excess amount of coal piling into discharge hopper.

(*h*) Overload and no-voltage release relays in the electrical control will stop the skip hoist in case of an excessive overload or of the failure of current.

(*i*) Movement of bucket is controlled by a positive mechanism geared direct to the winding machine and is not controlled by exposed switches in the skip runway.

(*j*) On medium and high-speed skips the forward axle of the bucket is equipped with spring relief bearings to reduce the shock when bucket engages with dumprails on overhaul.

(*k*) Provision is made so that it is impossible for the skip bucket to return upside down after discharging.

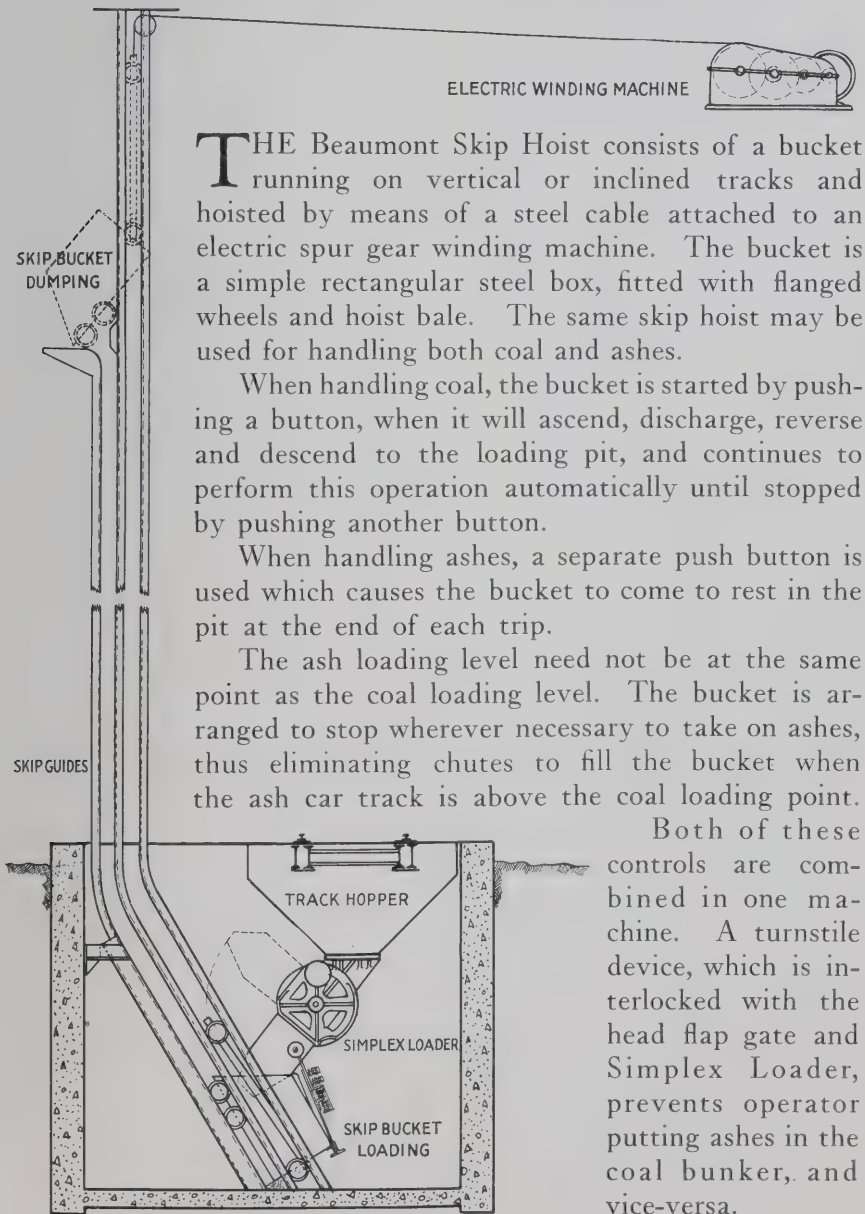
(*l*) A space of two feet is provided between the uppermost travel of bucket and the head blocks. This allows for any accidental overhaul of the bucket.

7. Triple Compensating Counterweight is used which reduces power consumption by smoothing out the power curve.

8. Patent Simplex Loader fills the bucket automatically at each load, does not underload nor flood the bucket; will handle mine run coal; requires a minimum depth pit; is entirely mechanical (not depending upon electrical timing devices, etc., for operation); is constructed mainly of steel castings, insuring rigid alignment, and is operated by a patent spring friction bale which eliminates shock.

9. On High-speed Skips absolute protection against runaway is obtained by the use of two-speed motors on alternating current and by dynamic braking on direct current.

The Beaumont Skip Hoist



THE Beaumont Skip Hoist consists of a bucket running on vertical or inclined tracks and hoisted by means of a steel cable attached to an electric spur gear winding machine. The bucket is a simple rectangular steel box, fitted with flanged wheels and hoist bale. The same skip hoist may be used for handling both coal and ashes.

When handling coal, the bucket is started by pushing a button, when it will ascend, discharge, reverse and descend to the loading pit, and continues to perform this operation automatically until stopped by pushing another button.

When handling ashes, a separate push button is used which causes the bucket to come to rest in the pit at the end of each trip.

The ash loading level need not be at the same point as the coal loading level. The bucket is arranged to stop wherever necessary to take on ashes, thus eliminating chutes to fill the bucket when the ash car track is above the coal loading point.

Both of these controls are combined in one machine. A turnstile device, which is interlocked with the head flap gate and Simplex Loader, prevents operator putting ashes in the coal bunker, and vice-versa.

Types of Beaumont Skip Hoists

Slow Speed—Unbalanced

THIS type is used principally for ash handling service, the skip bucket being hoisted at 75 feet per minute. It is equipped with semi-magnetic control, without slow down. Usually built in 20, 40 and 60 cubic foot sizes, with capacities ranging from 7 to 22 tons of ashes per hour at a 75-foot lift.

Medium Speed—Unbalanced

Used for either coal or ash handling, the hoisting speed being 125 feet per minute. It is equipped with semi-magnetic control without slow down. Usually built in 20, 40 and 60 cubic foot sizes, with a capacity range of from 32 to 48 tons of coal per hour at a 75-foot lift.

Medium Speed—Counterweighted

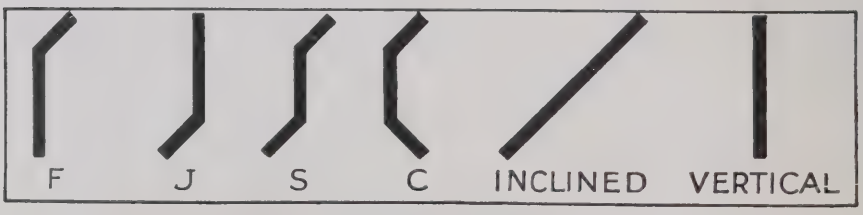
Used principally for coal handling, the hoisting speed being 125 feet per minute. It is equipped with semi-magnetic control and no slow down. It may be used to handle ashes also. Counterweight is used to reduce power consumption, as this type of skip uses buckets of 40 to 200 cubic foot capacity, hoisting from 40 to 189 tons of coal per hour at a 75-foot lift.

High Speed—Counterweighted

Used for coal handling service, with full magnetic control, and may be provided in addition with an auxiliary control so that it may be used as a single cycle skip to handle ashes. Bucket sizes range from 40 to 200 cubic foot capacity, hoisting from 58 to 272 tons of coal per hour at a 75-foot lift. Speed, 250 feet per minute, with slow down to 125 feet per minute at terminals.

High Speed—Balanced

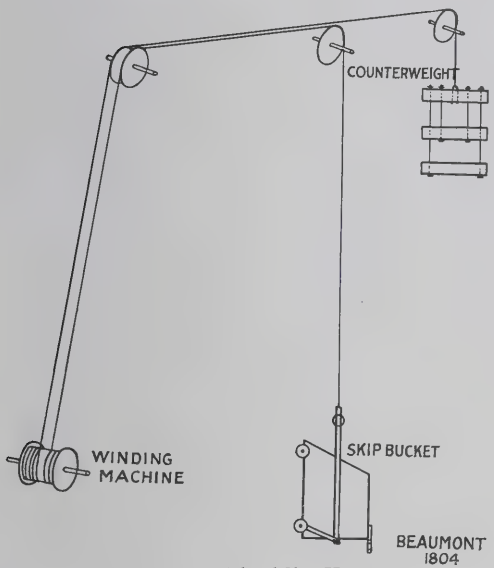
Used exclusively for coal handling service, with full-magnetic control. Bucket sizes range from 60 to 200 cubic foot capacity, hoisting from 174 to 544 tons of coal per hour at a 75-foot lift. Speed 250 feet per minute, with slow down to 125 feet per minute at terminals. Two buckets are used, one ascending while the other descends, both being operated by a single winding machine.



SKIP HOIST PATHS

Any type of skip hoist described above may be operated on any one of these paths

Diagrammatic Arrangements of Skip Hoists



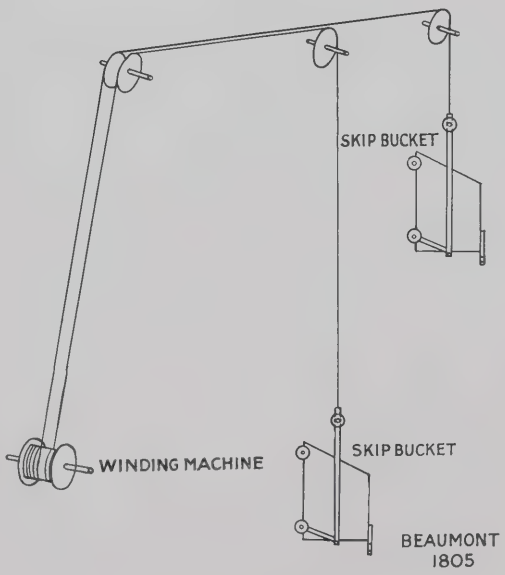
Counterweighted Skip Hoist

Counterweighted

COUNTERWEIGHTED Skip Hoists are built in bucket sizes of 40 to 200 cubic foot capacities, hoisting from 58 to 272 tons of coal per hour at a 75-foot lift. The counterweight is equal to the weight of the skip bucket plus half the load of material, so that at all times the winding machine is hoisting only half the load of material and no bucket load.

Balanced

Balanced Skip Hoists are built in bucket sizes of 60 to 200 cubic foot capacities, hoisting from 174 to 544 tons of coal per hour at a 75-foot lift. Two buckets are used, one ascending while the other descends, both being operated by a single winding machine. One bucket balances the other, so that at all times the winding machine is hoisting only the load of material and no bucket load.



Balanced Skip Hoist

The Beaumont Improved Skip Hoist Winding Machine

Spur Gear Type

THIS winding machine is specially designed for heavy, continuous service under severe operating conditions, being the product of many years' experience in building skip hoists.

It is the spur gear type, the drum being direct connected to the motor by a train of cut spur gears, which are fully enclosed by a cast iron or steel housing and run in oil.

This type was adopted only after years of experience with other types, such as worm gears, traction hoists, etc., all of which developed trouble from various causes. The direct connected spur gear hoist was designed to eliminate thrust bearings, loss of power through friction, excessive and rapid wear, heat generation (which causes trouble with lubrication) all of which are inherent with worm gear drives when subjected to continuous service.

Our spur gear winding machine provides for direct and positive control of the skip bucket at all times, without the use of less reliable track limit switches, such as are used with traction hoists and frequently with other types of hoists.

The machine is fitted with a shoe type magnetic brake, complete controlling equipment and slack cable switch. The entire operation of the machine is automatic and foolproof.

With full magnetic control, the operator pushes a starting button, causing the skip bucket to ascend, dump, reverse, descend to the loading pit, where it is automatically filled by the Simplex Loader, and again ascends, continuing through this cycle until the "stop" button is pushed.

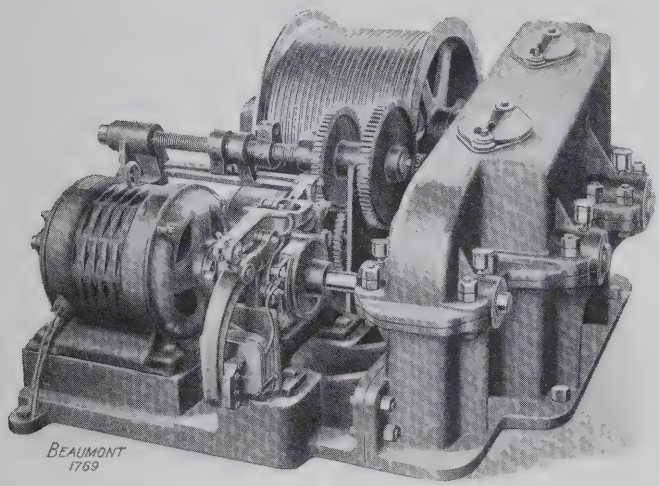
With semi-magnetic control, as generally used for ash handling service, the bucket will come to rest in the pit automatically at the end of each trip.

When both coal and ashes are handled by the same skip hoist, these two types of control are combined, so that coal may be handled continuously and ashes intermittently.

Features

1. Hoist drum has machine turned grooves.
2. Gears are cut and run in oil in a fully enclosed housing.
3. Bearings lubricated by oil cups.
4. Shoe type magnetic brake used on motor.
5. Control equipped with overload and no voltage release.
6. Slack cable device at drum will throw off motor if cable becomes slack.
7. All gears cut spur, meshing with cut steel pinions.
8. Bearings cast integral with frame, insuring rigid alignment.

Winding Machine No.	1	2	2-A	3	3-A	4	4-A	4-B
DRUM Diameter × Face Inches	24 × 18	30 × 24	30 × 24	36 × 30	36 × 30	44 × 30	44 × 30	44 × 30
SPEED Feet per Minute	75 125	75 125 250	75 125 250	125 250	125 250	125 250	125 250	125 250
Maximum Unbalanced Load in Pounds	4300 at 75′ 2700 at 125′	5700 at 75′ 5000 at 125′ 3700 at 250′	9750 at 75′ 7900 at 125′ 6700 at 250′	8500 at 125′ 6750 at 250′	13,750 at 125′ 11,250 at 250′	18,750 at 125′ 12,000 at 250′	31,000 at 125′ 19,750 at 250′	31,000 at 125′ 19,750 at 250′
Maximum Total Pull, Pounds	8000	24,000	24,000	27,000	27,000	31,000	31,000	35,000



Beaumont Improved Skip Hoist Winding Machine No. 1

Semi-Magnetic Control—Slow and Medium Speeds

THIS machine is designed to operate at a rope speed of either 75 or 125 feet per minute, without slow down. It is used for small or moderate capacity skips, and is designed for unbalanced rope pulls up to 4300 pounds at 75 feet per minute, or 2700 pounds at 125 feet per minute.

Specifications

DRUM is 24-inch diameter by 18-inch face, cast iron with machine turned spiral grooves.

GEARS are all cut cast iron and pinions cut steel, running in oil.

SHAFTS are designed for both bending and torsion, allowing a working stress not over 11,000 pounds per square inch.

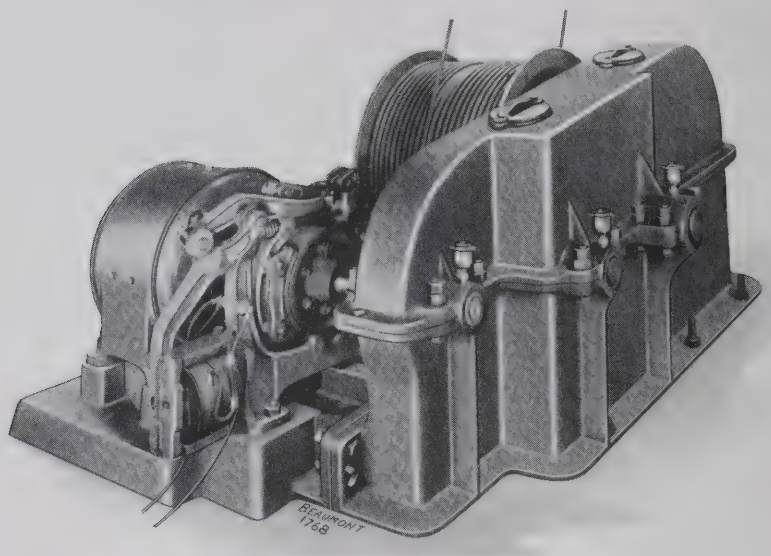
BEARINGS are cast integral with the gear housing and are of the rigid babbitted type, lubricated by oil cups. The outer end of the drum shaft is supported by a separate cast iron pedestal, of which the bearing is an integral part.

HOUSING is cast iron, oil tight and split horizontally at the bearings.

BASE PLATE is cast iron formed partly by the housing and partly by a separate cast iron base bolted thereto, and which supports the motor and magnetic brake.

BASE is held to its foundation by eight 1-inch bolts.

FLEXIBLE COUPLING is used to connect motor to the winding machine.



Beaumont Improved Skip Hoist Winding Machine Nos. 2 and 2-A

Semi-Magnetic Control—Slow and Medium Speeds

Full-Magnetic Control—High Speed

THIS machine is designed to operate at rope speeds of 75 and 125 feet per minute without slow down and 234 feet to 250 feet per minute (depending on current) with slow down to about half speed at both upper and lower terminals.

Machine is made in two types, No. 2 and No. 2-A. The No. 2 machine is designed for unbalanced rope pulls up to 3700 pounds, at 250 feet per minute, No. 2-A, having cut steel gears throughout, is good for unbalanced rope pulls up to 6700 pounds at 250 feet per minute. When used with counterweighted or balanced skips either machine is good for a combined pull of 24,000 pounds.

Specifications

DRUM is 30-inch diameter by 24-inch face, of cast iron with machine turned spiral grooves.

GEARS are all cut, those in No. 2 machine being of cast iron and those in No. 2-A being steel. All pinions in either machine are steel. Gears run in oil.

SHAFTS are designed for both bending and torsion, allowing a working stress not over 11,000 pounds per square inch.

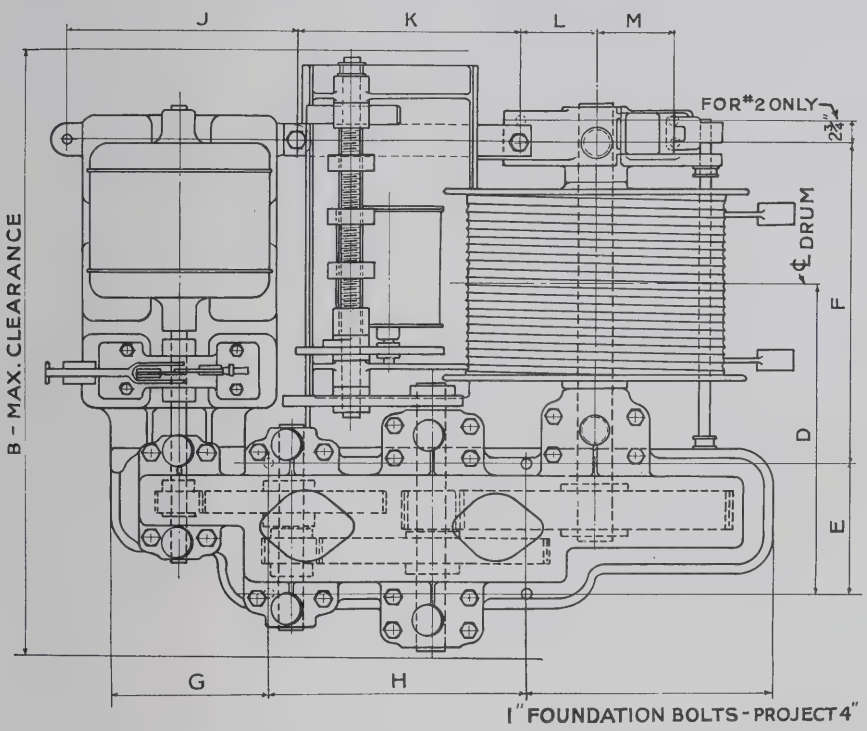
BEARINGS are cast integral with the gear housing and are the rigid babbitted type, lubricated by oil cups. The outer end of the drum shaft is supported by a separate cast iron pedestal, of which the bearing is an integral part.

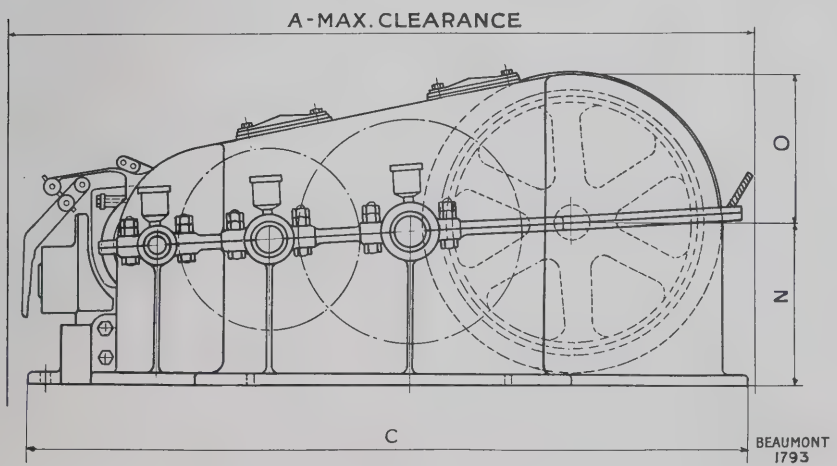
HOUSING is cast iron, oil tight and split horizontally at the bearings.

BASE PLATE is cast iron, formed partly by the housing and partly by a separate cast iron base bolted thereto, and which supports the motor and magnetic brake.

BASE is held to its foundation by ten 1-inch bolts.

FLEXIBLE COUPLING is used to connect motor to the winding machine.

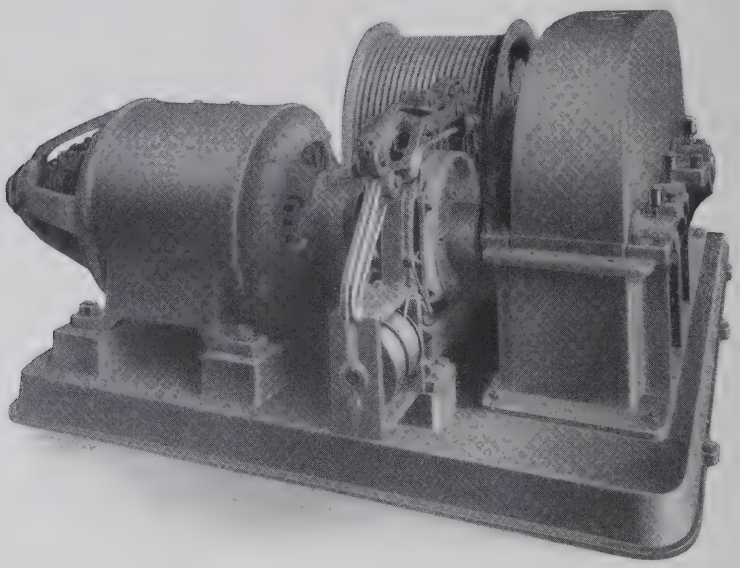




Layout of Nos. 1, 2 and 2-A Beaumont Skip Hoist Winding Machines

With Semi-Magnetic Control

Winding Machine	Weight No Motor Pounds	Maximum Unbalanced Pull			Max. Combined Pull Pounds	A	B	C	D	E	F	G	H	J	K	L	N	O
		75' P.M. Pounds	125' P.M. Pounds	250' P.M. Pounds														
No. 1	3500	4300	2700		8000	6'3"	4'9"	5'7"	2'5¼"	12¾"	2'8"	1'2¾"	1'11½"	1'9"	1'9"	7"	1'3¼"	1'2"
No. 2 & 2-A	5500	2-5700 2-A-9750	2-5000 2-A-7900	2-3700 2-A-6700	24,000	7'3"	5'6"	7'1⅝"	3'0¼"	1'3"	3'2⅜"	1'10½"	2'0"	2'6½"	2'0"	9¼"	1'7½"	1'5⅞"



Beaumont Improved Skip Hoist Winding Machines Nos. 3 and 3-A

Full Magnetic Control—Medium and High Speeds

THIS machine is designed to operate at rope speeds of 125 feet per minute without slow down and 234 feet to 250 feet per minute (depending on current) with slow down to about half speed at both upper and lower terminals.

Machine is built in two types, No. 3 and No. 3-A. The No. 3 machine is designed for unbalanced rope pulls up to 6750 pounds at 250 feet per minute, No. 3-A, having steel gears throughout, is good for unbalanced rope pulls up to 11,250 pounds at 250 feet per minute.

When used with counterweighted or balanced skips, either machine is good for a combined pull of 27,000 pounds.

Specifications

DRUM is 36-inch diameter by 30-inch face, cast iron with machine turned spiral grooves.

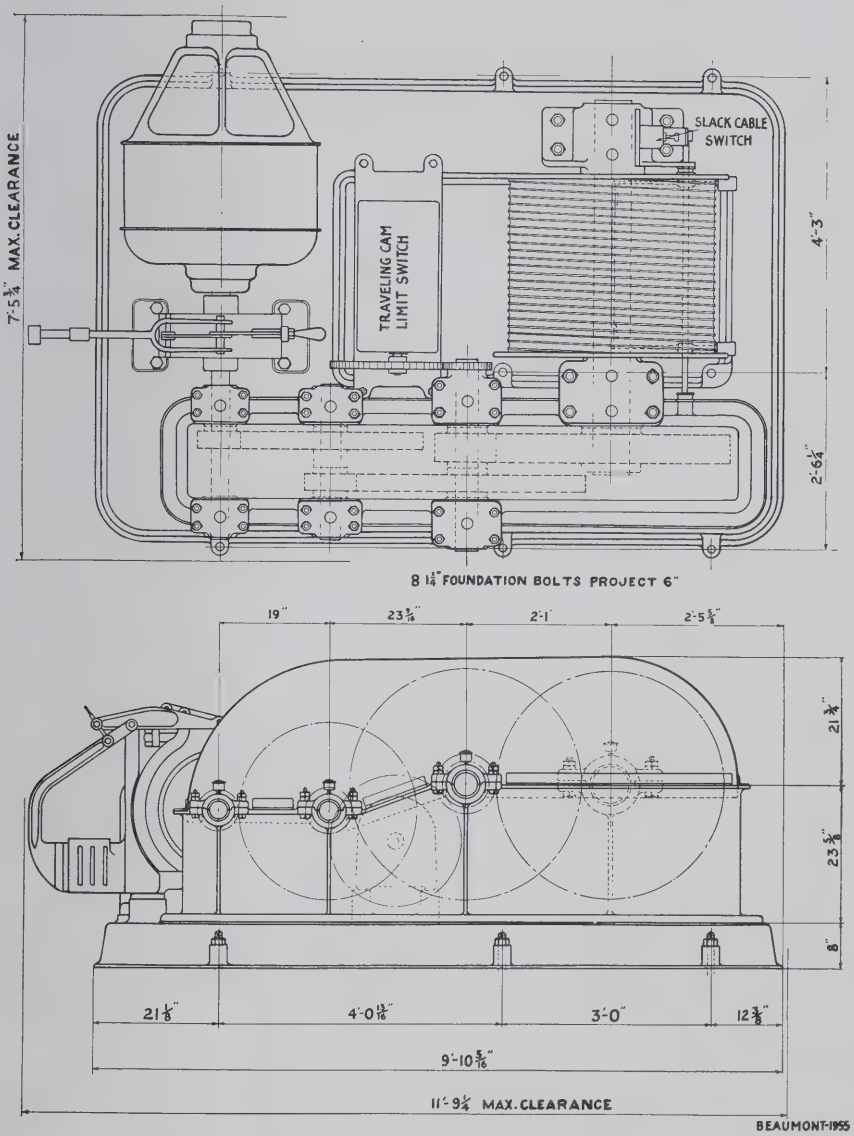
GEARS are all cut, those in No. 3 machine being of cast iron and those in No. 3-A being steel. All pinions in either machine are steel. Gears run in oil.

SHAFTS are designed for both torsion and bending, allowing a working stress not over 11,000 pounds per square inch.

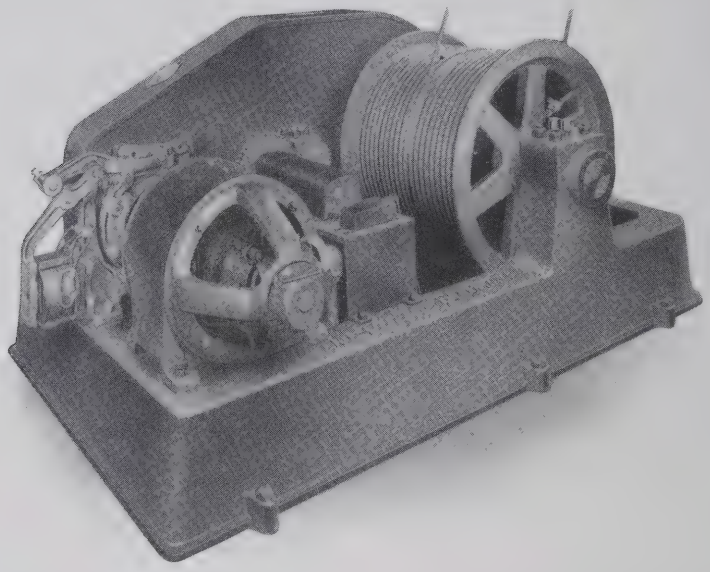
BEARINGS are cast with lower half integral with the gear housing and caps bolted on separately. They are of the rigid babbitted type, lubricated by oil cups. The outer end of the drum shaft is supported by a cast iron pedestal, of which the bearing is an integral part.

HOUSING formed partly by base and $^{3}/_{16}$-inch steel plate oil-tight gear case.

BASE is cast in one piece, supporting the entire winding machine, motor, magnetic brake, and all auxiliaries, and held to its foundation by eight $1\frac{1}{4}$-inch bolts.



Layout of Nos. 3 and 3-A
Beaumont Skip Hoist Winding Machines
With Full Magnetic Control



Beaumont Improved Skip Hoist Winding Machine Nos. 4, 4-A and 4-B

Mill Type—Full Magnetic Control—Medium and High Speeds

THIS machine is designed to operate at rope speeds of 125 feet per minute without slow down and 234 to 250 feet per minute (depending on current) with slow down to about half speed at both upper and lower terminals. Machine is made in three types, Nos. 4, 4-A and 4-B. The No. 4 machine is designed for unbalanced rope pulls up to 12,000 pounds at 250 feet per minute. The No. 4-A machine with cut steel gears throughout is good for unbalanced rope pulls up to 19,750 pounds at 250 feet per minute. No. 4-B machine is identical with 4-A except that drum shaft bearings are bronze bushed.

When used with counterweighted or balanced skips the Nos. 4 and 4-A machines are good for a combined pull of 31,000 pounds, the 4-B machine is good for a combined pull of 35,000 pounds.

Specifications

DRUM is 44-inch diameter by 30-inch face, cast iron with machine turned spiral grooves, and will accommodate 250 feet of 1¼-inch rope.

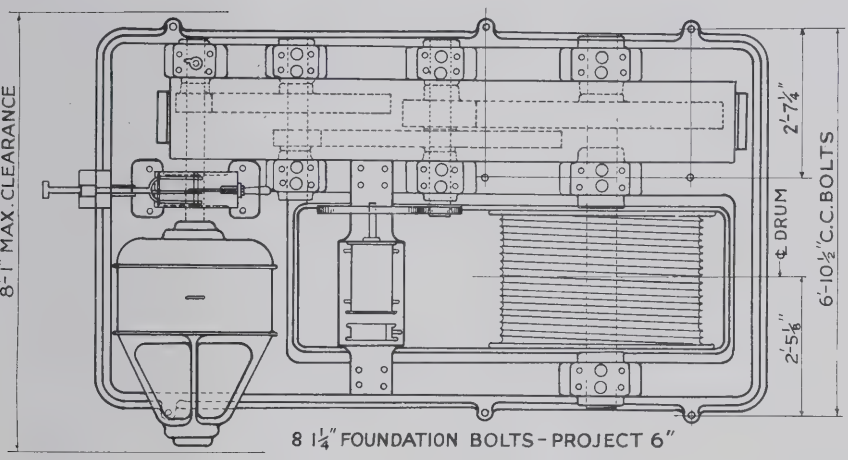
GEARS are all cut, those in No. 4 machine being of cast iron while those in Nos. 4-A and 4-B are steel. Pinions in all machines are steel. Gears run in oil.

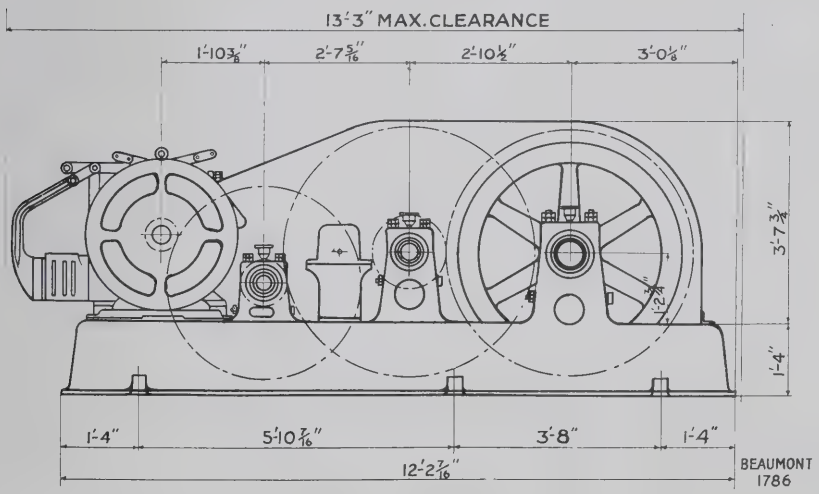
SHAFTS are designed for both torsion and bending, allowing a working stress of not over 11,000 pounds per square inch.

BEARINGS are the rigid pedestal type, cast integral with the base, the caps being bolted on separately. They are fitted with removable machine finished babbitted bushings and lubricated by grease cups, excepting the high-speed motor bearing, which is ring oiling. Drum shaft bearings on No. 4-B are bronze bushed.

HOUSING formed partly by base and $\frac{3}{16}$-inch steel plate oil-tight gear case.

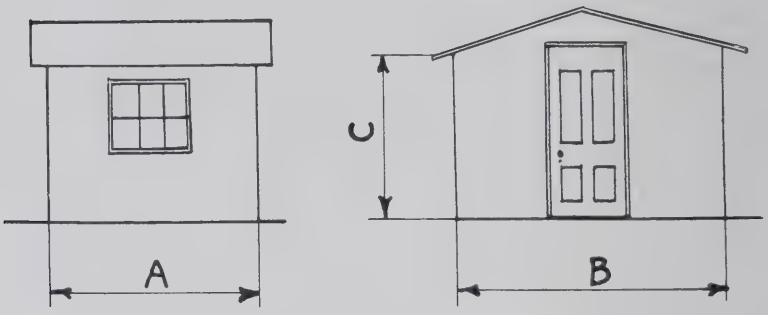
BASE is cast in one piece, supporting the entire winding machine, motor, magnetic brake and all auxiliaries, and held to its foundation by eight 1¼-inch bolts.





Layout of Nos. 4, 4-A and 4-B Beaumont Skip Hoist Winding Machines

With Full Magnetic Control



Hoist House

MAY be either wood or steel with sheathing. The control panel is mounted in the hoist house. Ample clearance is provided on all sides of the winding machine for access.

Door of the hoist house is usually kept locked, as the equipment is entirely automatic and requires no attention other than occasional lubrication.

Approximate Size of Hoist Houses

Winding Machine	1	2	3	4
A	10′ 3″	11′ 3″	16′ 0″	17′ 6″
B	8′ 9″	9′ 6″	11′ 6″	12′ 6″
C	6′ 6″	6′ 6″	6′ 6″	6′ 6″

Hoist House

Specifications

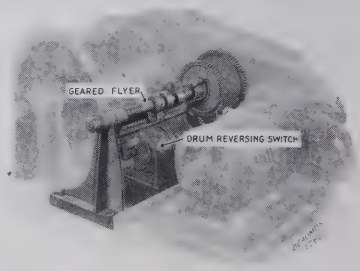
Wood Machinery House. Will consist of a wood frame house built up on concrete sills and covered with a composition roofing. Ample sash are provided for light and ventilation, also a wood door for access to the house. Floor is cement and is built by concrete contractor. Woodwork will receive two coats of paint.

Steel Machinery House. Will consist of a steel frame house sheathed with corrugated steel, No. 22 gauge on roof and No. 24 gauge on siding.

Other details are as specified for wood machinery house above.

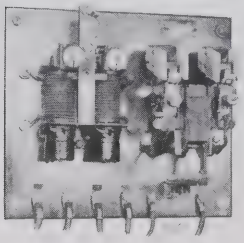
Semi-Magnetic Control

(Patent applied for)



Geared Flyer and Drum Reversing Switch
(Patent applied for)

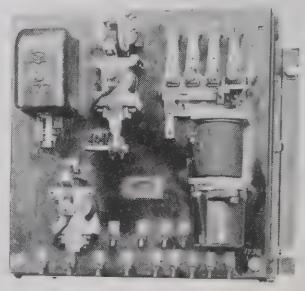
THIS type of control is used when no slow down is required. It reduces the number of magnetic switches necessary with slow down. An important feature of this control is that it cuts the main line circuit in case the pilot circuits fail to stop the motor. The geared flyer controls the length of the skip bucket travel. It consists of a cast iron frame supporting a screw driven by cut gears from the winding machine. On this screw a cam travels horizontally between two rotating cams, keyed to the screw at intervals which are determined by the bucket travel. The traveling cam engages either rotating cam, thereby rotating a frame or "flyer" which, by means of cut gears, turns the drum switch, which reverses the motor.



A. C. Semi-Magnetic Panel

For 75 feet per minute A. C. skips using squirrel cage motors with high-resistance rotors, control panel consists of a single wall-mounted slate, containing a magnetic main line contactor and inverse time limit overload relay. For 125 feet per minute skips, or in all cases where the skip bucket is loaded automatically, a control relay and timing relay is added. Slip ring motors are used for 25 H.P. and over and require, in addition, a time limit automatic starter with oil dashpot.

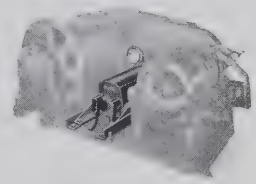
For 75 feet per minute D. C. skips, control panel consists of a single wall-mounted slate, containing a magnetic main line contactor, a time limit automatic starter with oil dashpot, a double coil overload relay and a brake relay. For 125 feet per minute skips, or in all cases where the skip bucket is loaded automatically, a control relay and timing relay is added.



D. C. Semi-Magnetic Panel

Full-Magnetic Control

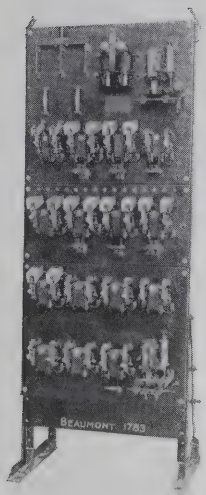
Traveling Cam Limit Switch



Traveling Cam Limit Switch

THIS device is actuated by cut steel gears from the winding machine countershaft. It makes the proper control connections for reversing the motor at the top and bottom limits of the skip and also for acceleration and deceleration. It consists of a nut traveling along a threaded shaft, the length of travel corresponding with the lift of the skip bucket. At the limits, the traveling nut trips out double pole switches, which reverses the hoist. Two extra switches are located on the shaft for slowing down the skip.

A. C. Full-Magnetic Control Panel



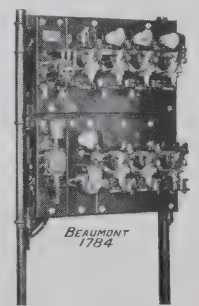
A. C. Full-Magnetic Control Panel

This panel consists of a series of slates bolted on a floor mounted angle iron frame, with resistance self-contained. Panel has main service switch and control fuses and inverse time limit overload protection. Acceleration for high and low speed motor circuit is of the positive time limit principle with all contactors the same size throughout, and provided with magnetic blowouts in the primary circuit.

The interval for loading and dumping is provided for by a positive time limit overload relay of the same size and type as the accelerating relay.

D. C. Full-Magnetic Control Panel

This panel consists of a series of slates bolted on a floor mounted steel and pipe frame. On the top of the panel is mounted a double coil time limit overload relay, pilot fuses, two sets of double pole reversing contactors, which are both mechanically and electrically interlocked, and one spring closed armature shunt slow down contactor. Bottom row—one control relay, one set of series relay accelerating contactors complete with magnetic blowouts, all progressively interlocked, and one timing interval relay.

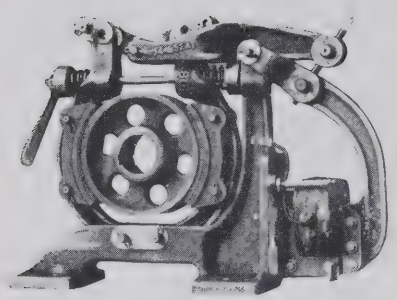


D. C. Full-Magnetic Control Panel

Accessories

Semi- and Full-Magnetic Skip Hoists

Shoe Type Magnetic Brake



Shoe Type Magnetic Brake

BRAKE is applied to the extended motor shaft. The shoes are held off by electro-magnetism and applied by powerful springs stopping the machine quickly when current is cut off. This occurs normally at the travel limits of the skip bucket and, in case of accidental current failure, at any point in the cycle. It also prevents winding machine running backwards in case of current failure. The use of the clapper type magnet eliminates all moving parts within the coil and the consequent wear, overheating, sticking or damage of insulation.

Slack Cable Switch

This switch is used to open the main contactor on either a semi-magnetic or full magnetic skip hoist, should the cable become slack from any cause. The slack cable falls over a bar across the under side of the winding machine drum, its weight acting through two simple levers to throw out the switch, thus cutting off the current.

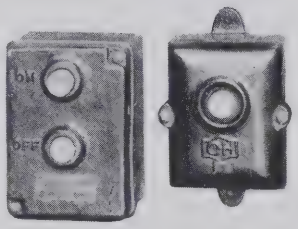
Slack Cable Switch

Accessories

Semi- and Full-Magnetic Skip Hoists

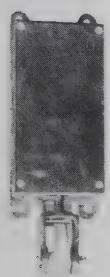
Push Button Station

FOR controlling the skip hoist, three buttons are provided, one "Off," one "On" and one "Start." When the "Off" button is pushed the control circuits are broken and the winding machine is dead. Pushing the "On" button completes the circuit with the exception of the gap at the "Start" button. Pushing the "Start" button closes this gap and causes the winding machine to operate.



Push Button Station

For the continuous operating skip hoist an extra button may be provided which, when locked in, will make skip a single cycle machine and when out, a continuous running machine.


Track Limit Safety Switch

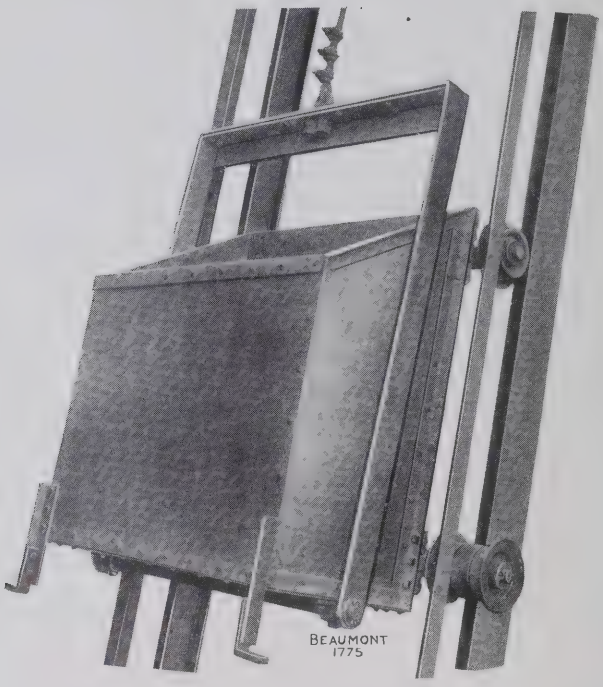
Track Limit Safety Switch

This limit switch is used to open the control circuit of the main magnetic contactor on a semi-magnetic or full-magnetic skip hoist. If the skip bucket or the counterweight travels a foot beyond its normal limits, it engages with the wheel opening the limit switch, thus throwing off the current and stopping skip hoist. Limit switches are provided at the top of skip bucket runway and at top of counterweight runway.

Safety Protection Switch

Safety Protection Switches

Safety switches are placed at the top and bottom of the skip bucket runway for the workmen to cut off the current while working at these points. Switches are of the single pole, knife blade type, enclosed in a dull black finish iron case.



Skip Buckets

Manually Loaded Type

BUCKET is a simple rectangular steel box open at the top and fitted with flanged wheels and hoist bale. It is discharged by inverting on dump rails.

Bucket is made of steel plate stiffened with angles and is mounted on square journaled through shafts fitted with cast iron single flanged chilled tread wheels, which are hollow and packed with oil waste for lubrication. On all medium and high speed skips the forward axle is equipped with spring relief bearings to reduce the shock when bucket engages with the dump rails on overhaul. (Patent applied for.)

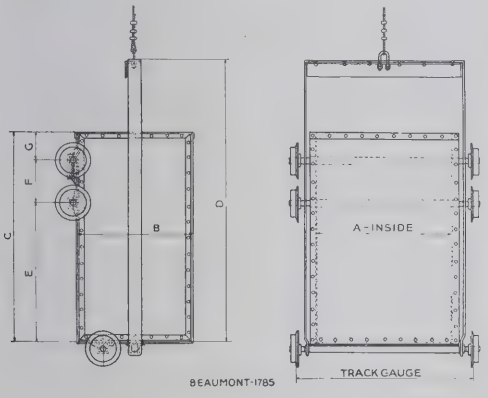
The bale is constructed of heavy flats on each side of bucket, being attached to a shaft secured to the under side of the bucket and having their upper ends connected by a cross beam, to which the hoisting rope is fastened.

Water capacities of the buckets are given below.

Water Capacity Bucket . . Cu. Ft.	20	40	60	80	100
Thickness Plate . . . . . Inch	3/16	3/16	1/4	1/4	1/4
Size Shaft . . . . . Inches	1 5/8	2 1/2	2 1/2	3	3
Diameter Wheels . . . . Inches	6 and 10	10	10	12	12

Skip Buckets—Manually Loaded

THIS bucket is used on unbalanced slow-speed and unbalanced, counterweighted or balanced medium speed skip hoists.

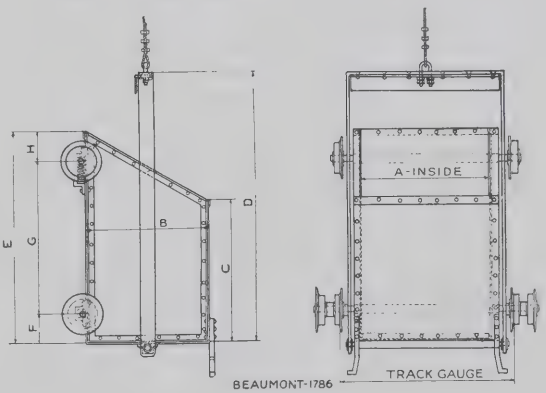


Vertical Discharge type of bucket discharges from a vertical tower. Bucket is loaded in a vertical position only.

Vertical Discharge Type

*Water Capacity Bucket, Cu. Ft.	Weight Pounds	Dia. Wheels	Track Gage	A	B	C	D	E	F	G
20.	950	6″	4′ 7″	3′ 6″	2′ 0″	3′ 0″	4′ 10″	1′ 9″	9″	6″
40.	1,600	10″	5′ 6″	4′ 2¼″	2′ 6″	4′ 0″	5′ 8″	1′ 10″	1′ 4″	10″
60.	2,000	10″	5′ 6″	4′ 2¼″	3′ 6″	4′ 3″	6′ 0″	2′ 1″	1′ 4″	10″
80.	2,400	12″	6′ 4″	5′ 0″	3′ 6″	4′ 9″	6′ 9″	2′ 5″	1′ 6″	10″
100.	2,900	12″	6′ 4″	5′ 0″	4′ 0″	5′ 0″	7′ 0″	2′ 8″	1′ 6″	10″

The Inclined Discharge type of bucket discharges from skip guides inclined at an angle of 50 degrees from the horizontal. Bucket may be loaded either in a vertical or inclined position.



Inclined Discharge Type

*Water Capacity Bucket, Cu. Ft.	Weight Pounds	Dia. Wheels	Track Gage	A	B	C	D	E	F	G	H
20.	1,200	10″	4′ 7″	3′ 6″	2′ 0″	2′ 10¼″	5′ 0″	4′ 0″	6″	3′ 0″	6″
40.	1,900	10″	5′ 6″	4′ 2¼″	2′ 6″	4′ 0″	6′ 6″	5′ 6″	7″	4′ 4″	7″
60.	2,300	10″	5′ 6″	4′ 2¼″	3′ 6″	4′ 3″	7′ 4″	6′ 4″	7″	5′ 2″	7″
80.	2,800	12″	6′ 4″	5′ 0″	3′ 6″	4′ 9″	7′ 4″	6′ 4″	7″	5′ 2″	7″
100.	3,500	12″	6′ 4″	5′ 0″	4′ 0″	5′ 0″	8′ 5″	7′ 5″	7″	6′ 3″	7″

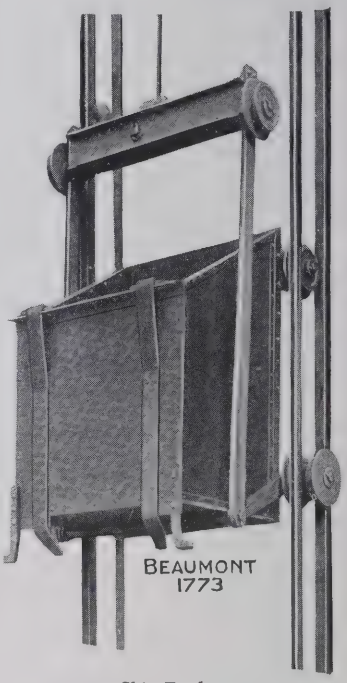
*Carrying capacity is equal to water capacity.

Skip Bucket

Automatically Loaded Type

BUCKET is a simple rectangular steel box, open at the top and fitted with flanged wheels and hoist bale. It is discharged by inverting on dump rails.

Bucket is made of steel plate stiffened with angles and is mounted on square journaled shafts fitted with cast iron, single flanged, chilled tread wheels, which are hollow and packed with oil waste for lubrication. The forward axle is equipped with spring relief bearings to reduce the shock when bucket engages with the dump rails on overhaul. (Patent applied for.)



Skip Bucket
Automatically Loaded Type
With Cable Take-up

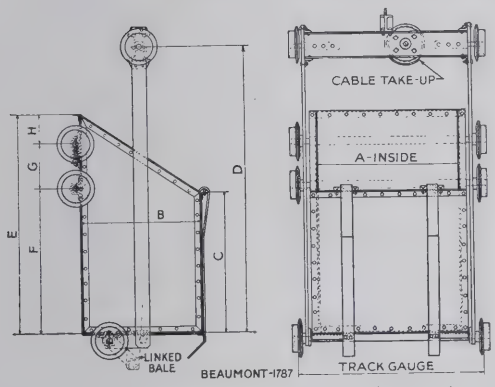
The Linked Bale (patent applied for) is constructed of heavy flats on each side of the bucket, their upper ends being connected by a cross beam to which the cable is attached and their lower ends to a shaft at the bottom of the bucket. This shaft is not rigidly attached to the bucket but is designed to allow the bale to lower 12 inches below point where bucket comes to a fixed stop, this feature absorbing the cable slack.

A Cable Take-up (patented) is provided on the hoist bale to adjust cable stretch; this is essential in all counterweighted and balanced skips, when used with Simplex Loader.

Water capacities of the buckets are given below.

Water Capacity Bucket, Cu. Ft.	40	60	80	100	125	150	175	200
Thickness Plate . . . Inch	3/16	1/4	1/4	1/4	5/16	5/16	3/8	3/8
Size Shafts . . . . Inches	2 1/2	2 1/2	3	3	3 1/2	3 1/2	3 1/2	3 1/2
Diameter Wheels . . Inches	10	10	12	12	15	15	15	15

Skip Buckets—Automatically Loaded



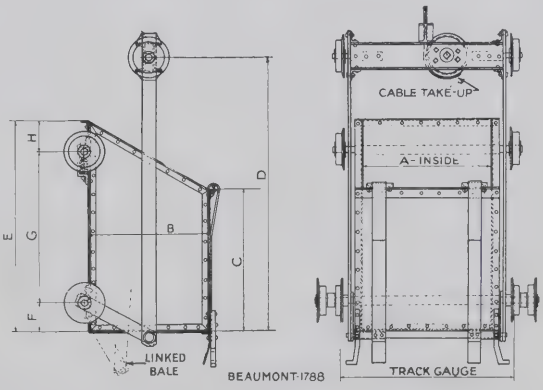
THIS bucket may be used on any medium and high-speed skip hoists, whether unbalanced, counterweighted or balanced. It is used only with the Simplex Loader. Cable take-up is omitted on all unbalanced buckets.

Vertical Discharge type of bucket discharges from a vertical tower. Bucket is loaded at an angle of 60 degrees from the horizontal. (See detail of loading pit.)

Vertical Discharge Type

Water Cap. Bkt., Cu. Ft.	Carryg. Cap.*	Wt. Lbs.	Dia. Whls.	Track Gage	A	B	C	D	E	F	G	H
40 . .	47	2,100	10″	5′ 6″	4′ 2¼″	3′ 2″	3′ 0″	7′ 1″	5′ 8″	3′ 6″	1′ 4″	10″
60 . .	71	2,500	10″	5′ 6″	4′ 2¼″	3′ 6″	4′ 3″	8′ 4″	6′ 11″	4′ 9″	1′ 4″	10″
80 . .	93	3,000	12″	6′ 4″	5′ 0″	3′ 6″	4′ 9″	8′ 10″	7′ 5″	5′ 1″	1′ 6″	10″
100 . .	113	3,700	12″	6′ 4″	5′ 0″	4′ 0″	5′ 0″	9′ 1″	7′ 8″	5′ 4″	1′ 6″	10″
125 . .	147	4,600	15″	7′ 1″	5′ 8″	4′ 6″	5′ 0″	9′ 1″	7′ 8″	4′ 11″	1′ 9″	12″
150 . .	172	5,500	15″	7′ 1″	5′ 8″	4′ 6″	6′ 0″	10′ 1″	8′ 8″	5′ 11″	1′ 9″	12″
175 . .	203	6,400	15″	7′ 10″	6′ 4″	5′ 0″	5′ 7″	9′ 8″	8′ 3″	5′ 6″	1′ 9″	12″
200 . .	226	7,400	15″	7′ 10″	6′ 4″	5′ 0″	6′ 4″	10′ 5″	9′ 0″	6′ 3″	1′ 9″	12″

Inclined Discharge type of bucket discharges from guides inclined at an angle of 50 degrees from the horizontal. Bucket is loaded at an angle of 60 degrees from the horizontal. (See detail of loading pit.)



Inclined Discharge Type

Water Cap. Bkt., Cu. Ft.	Carryg. Cap.*	Wt. Lbs.	Dia. Whls.	Track Gage	A	B	C	D	E	F	G	H
40 . .	47	2,100	10″	5′ 6″	4′ 2¼″	3′ 2″	3′ 0″	7′ 1″	5′ 8″	7″	4′ 6″	7″
60 . .	71	2,500	10″	5 6″	4′ 2¼″	3′ 6″	4′ 3″	8′ 4″	6′ 11″	7″	5′ 9″	7″
80 . .	93	3,000	12″	6′ 4″	5′ 0″	3′ 6″	4′ 9″	8′ 10″	7′ 5″	7″	6′ 3″	7″
100 . .	113	3,700	12″	6′ 4″	5′ 0″	4′ 0″	5′ 0″	9′ 1″	7′ 8″	7″	6′ 6″	7″
125 . .	147	4,600	15″	7′ 1″	5′ 8″	4′ 6″	5′ 0″	9′ 1″	7′ 8″	9″	6′ 2″	9″
150 . .	172	5,500	15″	7′ 1″	5′ 8″	4′ 6″	6′ 0″	10′ 1″	8′ 8″	9″	7′ 2″	9″
175 . .	203	6,400	15″	7′ 10″	6′ 4″	5′ 0″	5′ 7″	9′ 8″	8′ 3″	9″	6′ 9″	9″
200 . .	226	7,400	15″	7′ 10″	6′ 4″	5′ 0″	6′ 4″	10′ 5″	9′ 0″	9″	7′ 6″	9″

*Carrying capacity is actual volume deposited in bucket by Simplex Loader.

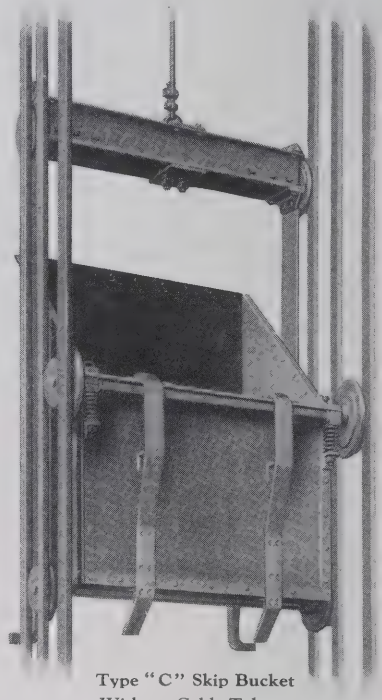
Skip Bucket

Type "C"

Automatically Loaded

BUCKET is a simple rectangular steel box, open at the top and fitted with flanged wheels and hoist bale. It is discharged by inverting on dump rails.

Bucket is made of steel plate stiffened with angles and is mounted on square journaled shafts fitted with cast iron, single flanged, chilled tread wheels, which are hollow and packed with oil waste for lubrication. The forward axle is equipped with spring relief bearings to reduce the shock when bucket engages with the dump rails on overhaul. (Patent applied for.)



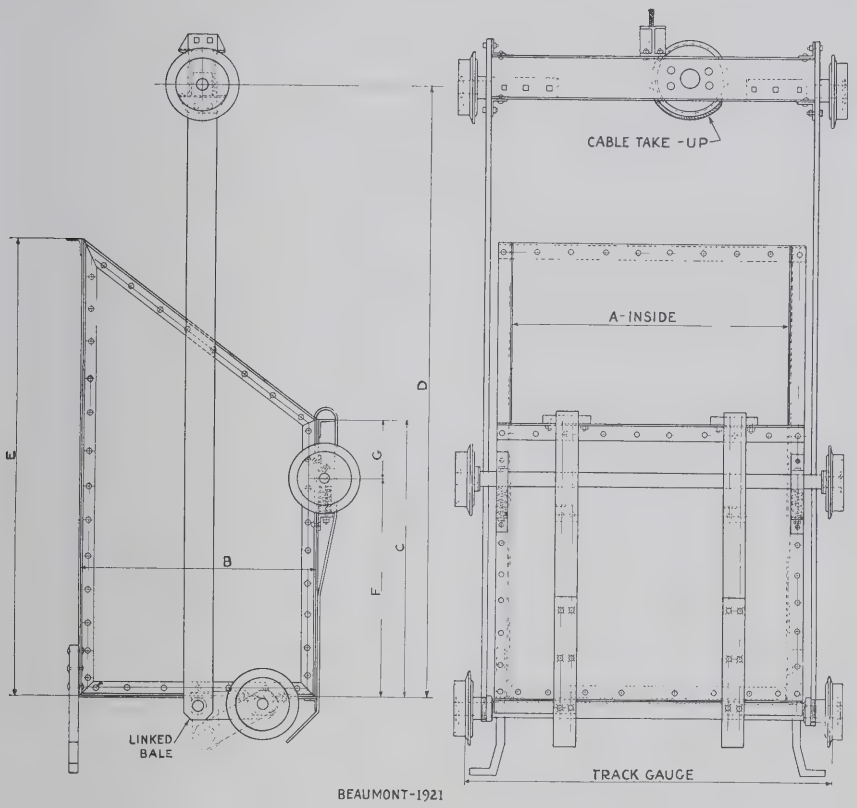
Type "C" Skip Bucket
Without Cable Take-up

The Linked Bale (patent applied for) is constructed of heavy flats on each side of the bucket, their upper ends being connected by a cross beam by which the cable is attached and their lower ends to a shaft to the bottom of the bucket. This shaft is not rigidly attached to the bucket but is designed to allow the bale to lower 12 inches below point where bucket comes to a fixed stop, this feature absorbing the cable slack.

A Cable Take-up (patented) is provided on the hoist bale to adjust cable stretch; this is essential in all counterweighted and balanced skips, when used with Simplex Loader.

Water capacities of the buckets are given below.

Water Capacity Bucket, Cu. Ft.	40	60	80	100	125	150	175	200
Thickness Plate . . . Inch	3/16	1/4	1/4	1/4	5/16	5/16	3/8	3/8
Size Shafts . . . . Inches	2½	2½	3	3	3½	3½	3½	3½
Diameter Wheels . . Inches	10	10	12	12	15	15	15	15



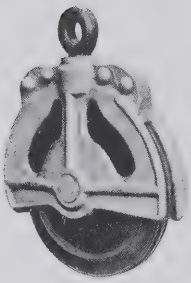
Type "C" Skip Bucket

Automatically Loaded

Vertical or Inclined Discharge

Water Cap. Bkt., Cu. Ft.	Carryg. Cap.	Wt. Lbs.	Dia. Whls.	Track Gage	A	B	C	D	E	F	G
40. . . .	47	2,100	10″	5′ 6″	4′ 2¼″	3′ 2″	3′ 0″	7′ 9″	5′ 8″	2′ 10⅛″	1⅞″
60. . . .	71	2,500	10″	5′ 6″	4′ 2¼″	3′ 6″	4′ 3″	9′ 0″	6′ 11″	3′ 9″	6″
80. . . .	93	3,000	12″	6′ 4″	5′ 0″	3′ 6″	4′ 9″	9′ 6″	7′ 5″	3′ 11″	10″
100. . . .	113	3,700	12″	6′ 4″	5′ 0″	4′ 0″	5′ 0″	9′ 9″	7′ 8″	4′ 2″	10″
125. . . .	147	4,600	15″	7′ 1″	5′ 8″	4′ 6″	5′ 0″	9′ 9″	7′ 8″	4′ 0″	12″
150. . . .	172	5,500	15″	7′ 1″	5′ 8″	4′ 6″	6′ 0″	10′ 9″	8′ 8″	5′ 0″	12″
175. . . .	203	6,400	15″	7′ 10″	6′ 4″	5′ 0″	5′ 7″	10′ 4″	8′ 3″	4′ 7″	12″
200. . . .	226	7,400	15″	7′ 10″	6′ 4″	5′ 0″	6′ 4″	11′ 1″	9′ 0″	5′ 4″	12″

Cable and Sheaves



13- and 23-inch Head Blocks

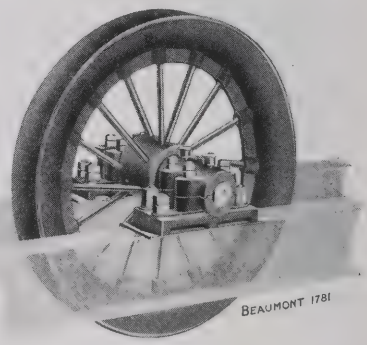
THE Hoisting Cable is Roebling "Blue Center" Improved Plough steel wire rope, with hemp center and composed of eight strands with nineteen wires to each.

HEAD BLOCKS are of the size given in table below. They are built with cast steel housings and sheaves, bronze bushed and lubricated by compression grease cups. Blocks are used only on skips having 20 and 40 cubic foot buckets.

SHEAVES are used on all skips having buckets larger than 40 cubic feet. Sheaves larger than 36 inches are of the "bicycle" type, consisting of a cast iron hub and rim with steel spokes, and are keyed to a shaft which runs in bearings set on each side of the sheave. The 30-inch and 36-inch diameter sheaves are semi-steel with cast arms.

Bearings are of the rigid babbitted type lubricated by compression grease cups.

By keying the sheave to the shaft, causing the shaft to revolve in the bearings, the wearing surface of the moving parts is made considerably greater than if the shaft was held rigid and the sheave revolved on the shaft.

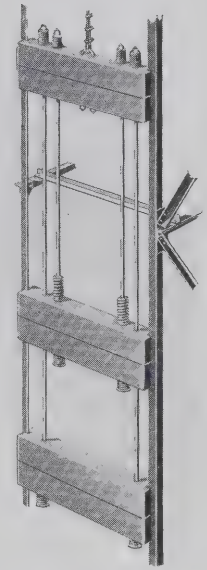


42 to 60-inch Head Sheaves

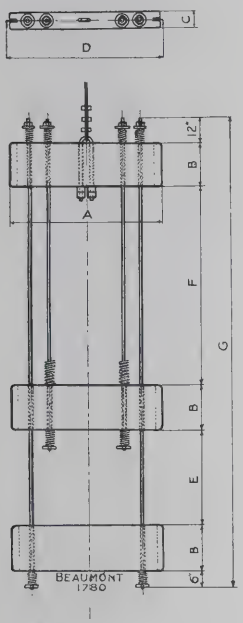
Water Capacity Bucket, Cu. Ft.		20	40	60	80	100	125	150	175	200
Size Sheaves	Inches	13 Block	23 Block	30	30	36	42	48	54	60
Diameter Cable	Inches	½	⅝	¾	⅞	1	1⅛	1¼	1⅜	1½

Triple Compensating Counterweight

THE purpose of this triple compensating counterweight is to reduce power consumption by smoothing out the power curve. Counterweight is of the sectional cast iron triple compensating type, operating in steel angle guides. It is so designed that the amount of counterweight is first reduced when the pull of the bucket is lessened by the bucket being partially supported on the dump rails and further reduced when the bucket is discharging. By keeping the amount of counterweight in step with the pull of the bucket, the motor speed is constant, preventing the sudden increase in speed that would otherwise occur at the dumping point in spite of slow down control. The total amount of counterweight is such that the load on the motor is approximately the same when lowering as when hoisting.



Triple Compensating Counterweight



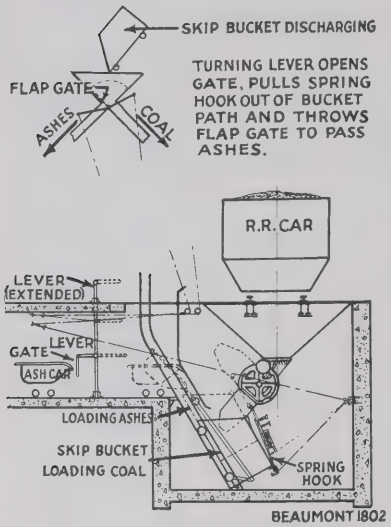
Rope for counterweight is the same size and type as the skip bucket hoisting rope.

Counterweights for Vertical Skip Hoists

Water Capacity Bucket, Cu. Ft.	40	60	80	100	125	150	175	200
A	4′ 6″	5′ 1″	5′ 9″	5′ 9″	6′ 3″	6′ 3″	6′ 9″	6′ 9″
B	1′ 0″	1′ 5″	1′ 3″	1′ 7″	1′ 5″	1′ 8″	1′ 6″	1′ 8″
C	5″	6″	8″	8″	10″	10″	1′ 0″	1′ 0″
D	4′ 9″	5′ 4″	6′ 0″	6′ 0″	6′ 6″	6′ 6″	7′ 0″	7′ 0″
E	3′11″	5′ 1″	5′ 1″	6′ 0″	6′ 0″	6′10″	6′10″	7′ 4″
F	3′ 4″	4′ 3″	4′ 3″	5′ 0″	5′ 0″	5′ 8″	5′ 8″	6′ 2″
G	12′ 3″	15′ 1″	14′ 7″	17′ 3″	16′ 9″	19′ 0″	18′ 6″	20′ 0″
Total Wt., Lbs..	3,100	4,650	6,200	7,750	9,690	11,630	13,560	15,500

Counterweights will vary with angle of runway.

Interlocking Devices



Interlocking Device
Single Skip for both Coal and Ashes
(Patent applied for)

Mechanical

(Patent applied for)

ON Single Skip Hoists used for both coal and ashes, a mechanical interlock is provided which positively prevents dumping ashes into the coal bunker, or vice-versa.

A vertically pivoted "turnstile" gate placed across the ash car track prevents the ash car from approaching the skip bucket unless this gate is open. By opening this gate, the operator automatically locks back the spring hook controlling the Simplex Loader so that no coal can be handled and at the same time automatically turns the flap gate at the discharge point over the bunker so that ashes will flow to the ash bunker.

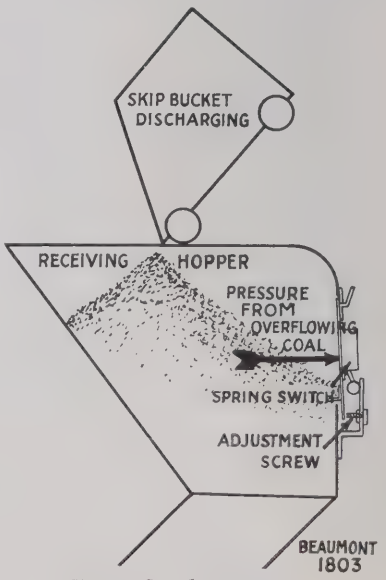
When this gate is closed the Simplex Loader is again put in action and the flap gate overhead set to receive coal. When the ash car track is below grade an extension of the vertical pivot projects above the ground and is fitted with indicators so that the coal car men know when the skip is free for their use.

Electrical

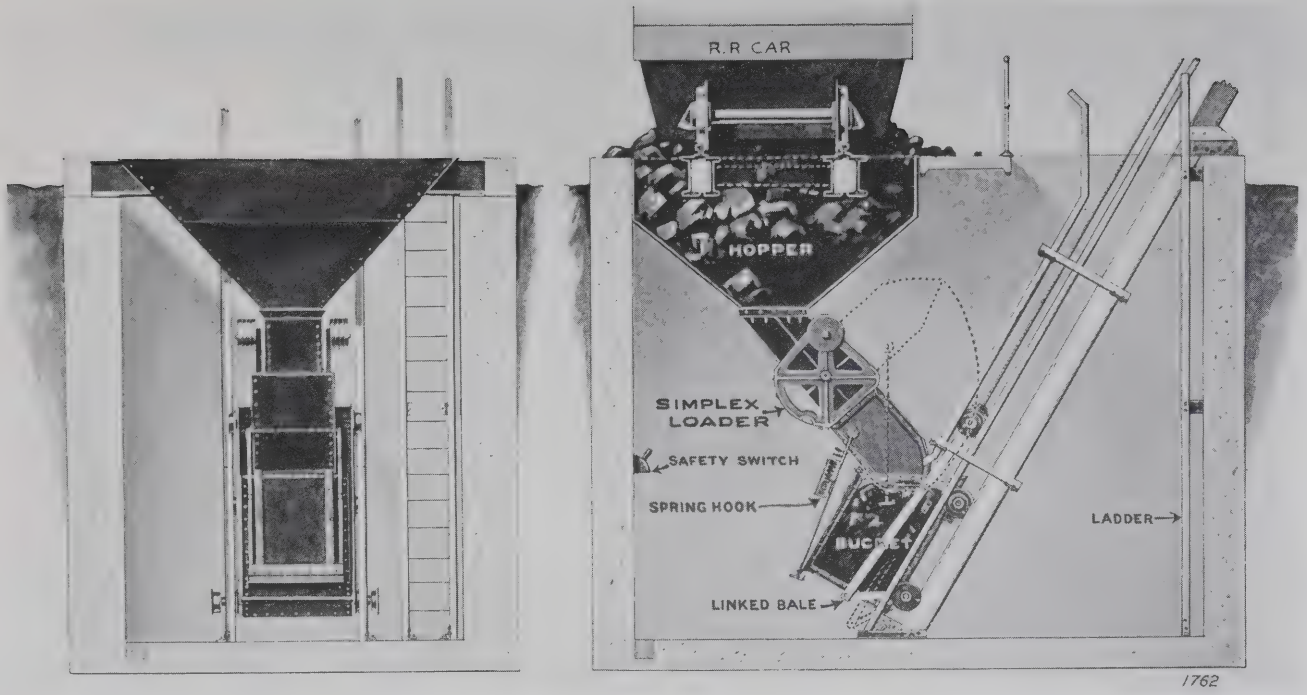
(Patent applied for)

Coal skips usually discharge into a receiving hopper from which the coal is fed to a crusher. Should the crusher stop while the skip continues to operate the receiving hopper would soon fill up and overflow.

To prevent this, a hopper overflow switch is provided in the receiving hopper. A section of the hopper is hinged and lays against a normally closed spring switch wired in with the skip hoist control. The pressure against the hopper side from the coal piling up will throw out the switch and stop the skip hoist.

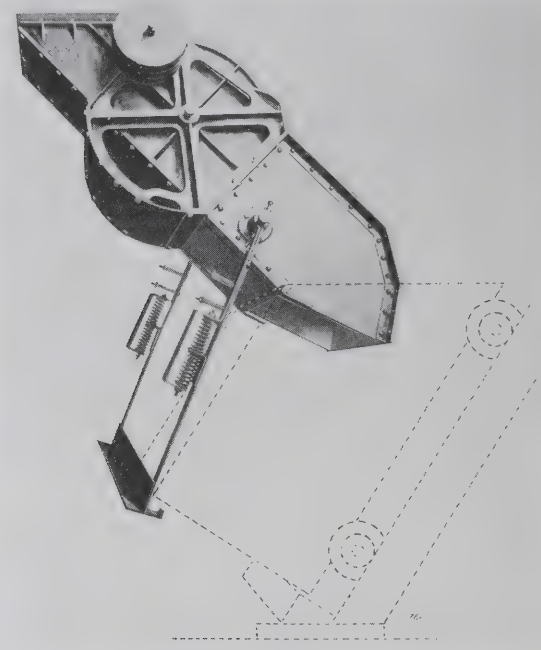


Hopper Overflow Switch
(Patent applied for)



Beaumont Patented Simplex Loader, Track Hopper and Skip Bucket

This patented device is the simplest and most effective means of loading the skip bucket *automatically*. It is used under track hoppers, as shown, or attached to equalizing hoppers for coal, coke or ashes. Loader is bolted direct to the underside of the hopper.



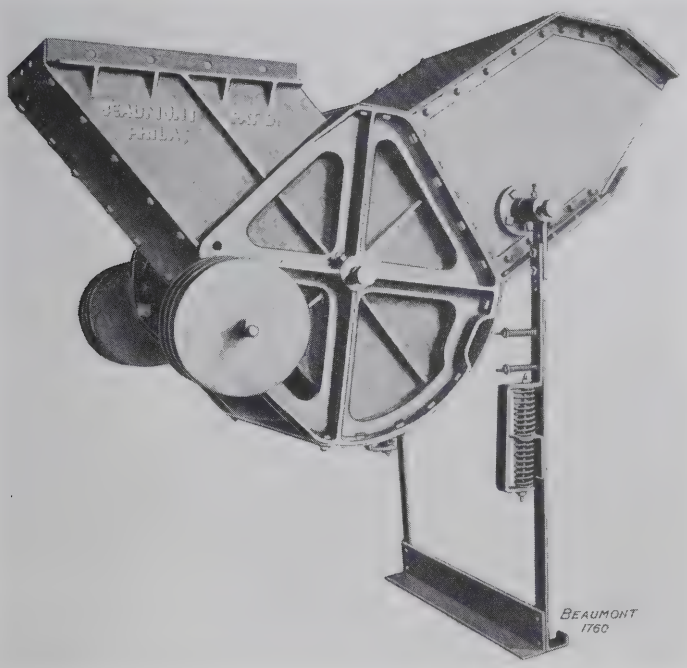
Loader Open

Beaumont Simplex Loader for Skip Buckets

(Patented)

Advantages and Mechanical Features

1. *Automatically* loads the skip bucket; the skip hoist will therefore work at maximum capacity because there is no delay in loading and because bucket is *filled* at each loading. No attendant is necessary.
2. Skip bucket cannot be flooded or underloaded.
3. Will handle run of mine coal because an undercut pivoted gate is used.
4. The pivoted chute is balanced to reduce power and shock.
5. Pivoted gate sides are cast steel; chute sides are cast iron; rigid alignment and permanence are thereby secured.
6. Large steel pivot pins and cast iron pivot bearings, lubricated by compression grease cups, are used.
7. Latches, triggers, etc., are avoided.
8. Pit is minimum depth.
9. Opening hook is provided with shock absorbers to make operation smooth and noiseless. (Patent applied for.)
10. Opening hook will not engage with descending bucket if bucket falls, thus a wreck is avoided.
11. Loader is opened and closed by direct contact with skip bucket.
12. Does not depend upon electrical timing devices, etc., for operation.



Loader Closed

Beaumont Simplex Loader for Skip Buckets

(Patented)

Specifications

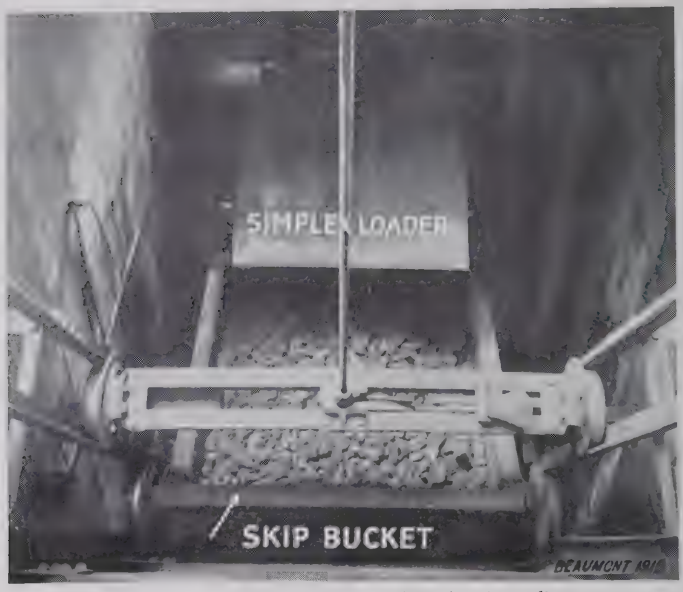
LOADER consists of a fixed chute or body bolted direct to the under side of a hopper. This chute has cast iron sides and a heavy steel plate bottom. To it is suspended a pivoted undercut gate built with cast steel sides and heavy steel plate top and bottom.

This pivoted gate is opened by the descending skip bucket coming in contact with, and pulling down, a spring hook attached to the chute, and is closed by the ascending skip bucket.

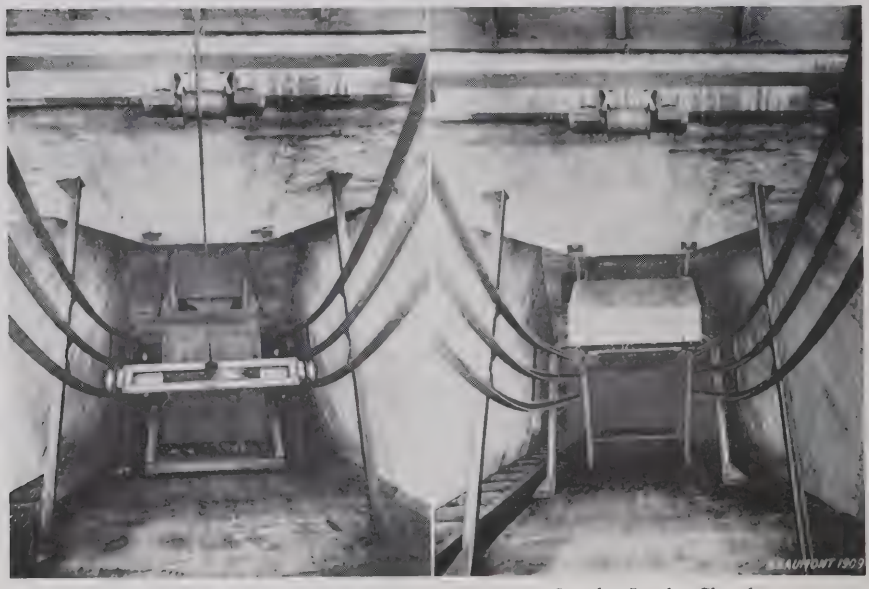
Counterweights are attached to the pivoted chute to assist in closing and to keep it closed.

The hook is of the spring draft friction type, which equalizes the pull on the chute and prevents undue shock to bucket and loader at the instant of contact. (Patent applied for.)

Should the skip bucket fall by accident, the sudden impact causes the hook to swing back out of the path of the falling bucket, preventing any damage to the loader.



Simplex Loader Closing—Loaded Bucket Ascending

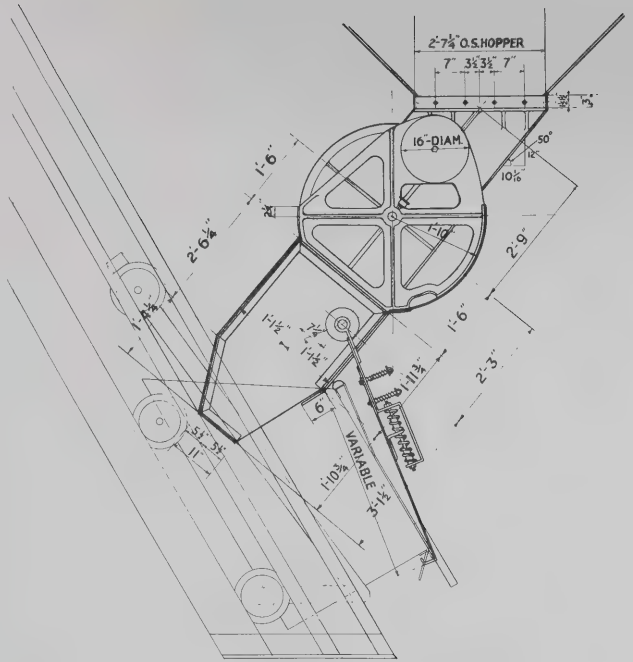


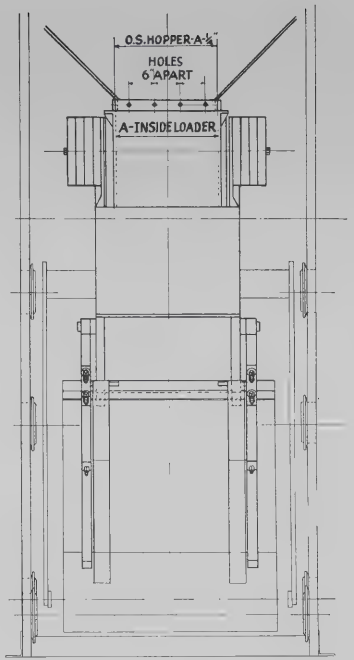
Simplex Loader Opened
Bucket Loading

Simplex Loader Closed
Bucket Out of Pit

Beaumont Simplex Loader for Skip Buckets

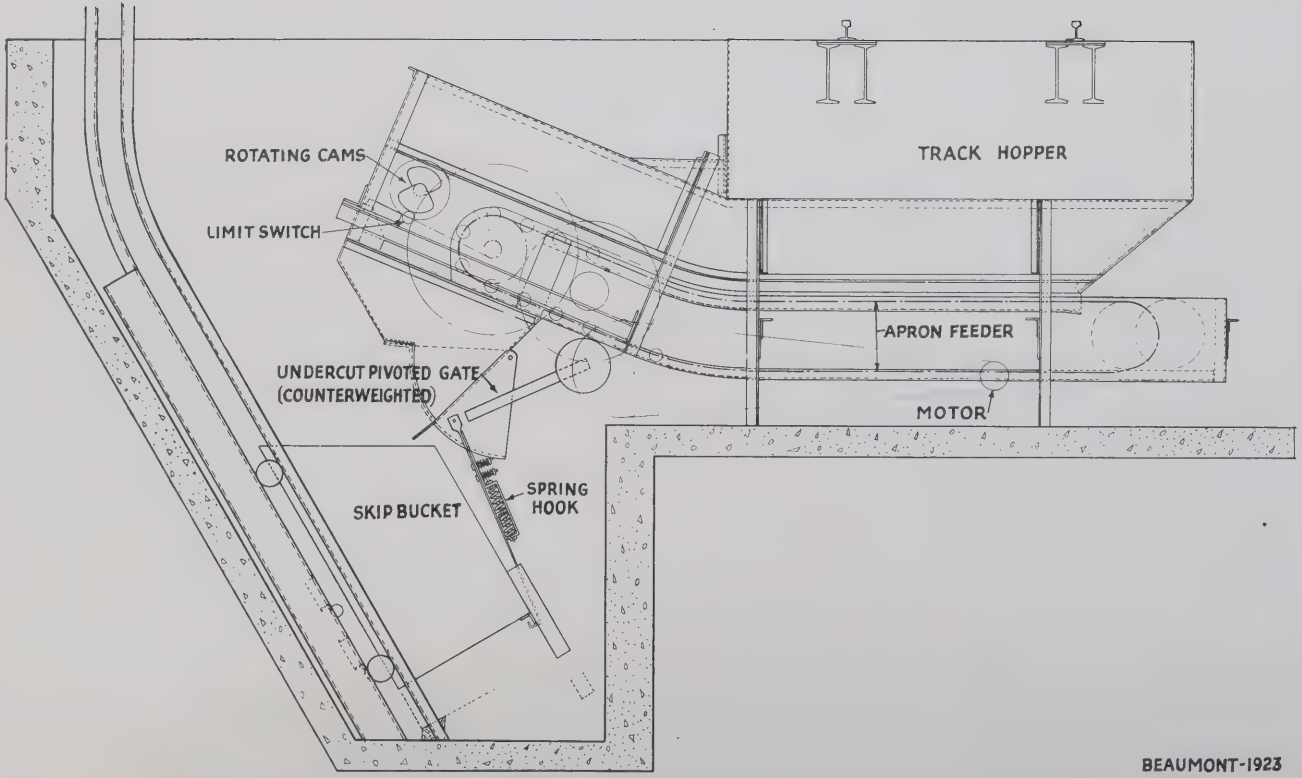
(Patented)





SIZE BUCKET	20	40	60	80	100	125	150	175	200
WIDTH "A"	2'-0	2'-0	2'-0	3'-0	3'-0	3'-0	3'-0	3'-0	3'-0

Layout of Beaumont Patented Simplex Loader



Layout of Beaumont Patent Apron Feeder Skip Loader

Beaumont Patent Apron Feeder Skip Loader

IN cases where the plant layout requires that the coal be conveyed horizontally before loading into the skip hoist, we recommend and use the Beaumont Patent Apron Feeder Skip Loader.

It has the following advantages:

(1) Automatically loads the skip bucket; the skip hoist will therefore work at maximum capacity because there is no delay in loading and because bucket is filled at each loading. No attendant is necessary.

(2) Skip bucket cannot be flooded or underloaded.

(3) Will handle run of mine coal because an undercut pivoted gate is used.

(4) The pivoted gate is balanced to reduce power and shock.

(5) Pivoted gate sides are cast steel; chute sides are cast iron; rigid alignment and permanence are thereby secured.

(6) Large steel pivot pins and cast iron pivot bearings, lubricated by compression grease cups, are used.

(7) Latches, triggers, etc., are avoided.

(8) Pit is minimum depth.

(9) Opening hook is provided with shock absorbers to make operation smooth and noiseless.

(10) Opening hook will not engage with descending bucket if bucket falls, thus a wreck is avoided.

(11) Gate is opened and closed by direct contact with skip bucket.

Specifications

FEEDER consists of a series of overlapping steel plate aprons 30 inches wide by $\frac{3}{16}$ inch thick, of the beaded and curved flight type. Aprons are suspended between 9-inch pitch steel thimble roller chain.

Feeder operates in a substantial structural steel frame, having $\frac{3}{16}$-inch by 18-inch stationary sides at the carrying run of the apron to retain coal on the apron. Return run of apron rolls on $3\frac{1}{2}$-inch by $3\frac{1}{2}$-inch by $\frac{5}{16}$-inch angles riveted to the feeder frame.

LOADER consists of a fixed chute or body bolted direct to the under side of the feeder frame. This chute has cast iron sides and a heavy steel plate bottom. To it is suspended a pivoted undercut gate built with cast steel sides and heavy steel plate top and bottom.

This pivoted gate is opened by the descending skip bucket coming in contact with, and pulling down, a spring hook attached to the chute, and is closed by the ascending skip bucket.

COUNTERWEIGHTS are attached to the pivoted chute to assist in closing and to keep it closed.

THE HOOK is of the spring draft friction type, which equalizes the pull on the chute and prevents undue shock to bucket and loader at the instant of contact.

Should the skip bucket fall by accident, the sudden impact causes the hook to swing back out of the path of the falling bucket, preventing any damage to the gate.

Feeder is driven through a train of gears by a motor. The head shaft of the feeder is extended, and through a chain drive, revolving two cams. These cams make one complete revolution for the exact travel of feeder required to fill the skip bucket. Upon completing its cycle, one cam trips out a switch, automatically stopping the apron feeder and starting the skip hoist.

The ascending skip bucket closes the gate and the descending bucket opens it. When the descending bucket bottoms in the loading pit the apron feeder is automatically started.

Beaumont Standard Track Hoppers

No.	Size	Single or Double Outlet	One or Two Railroad Tracks	Nominal Capacity in Tons
1	10′ x 12′	Single	One	5
2	14′ x 20′	Single	One	12
3	14′ x 20′	Double	One	18
4	14′ x 28′	Single	One	25
5	14′ x 28′	Double	One	25
6	25′ x 20′	Double	Two	48
7	25′ x 28′	Double	Two	67

To Find Size Track Hopper Required

IN selecting the size track hopper required for a given skip hoist capacity in tons per hour, the size railroad car, track hopper capacity in tons, time lost moving car on and off hopper, and time dumping car all must be considered in arriving at the capacity of the complete system in tons per hour.

Let C = capacity in tons per hour of skip hoist
Let T = capacity of track hopper in tons
Let R = capacity of railroad car in tons
Let D = time in minutes lost moving car on and off hopper
Let M = time in minutes lost in actual dumping of car
Let S = capacity of complete system in tons per hour

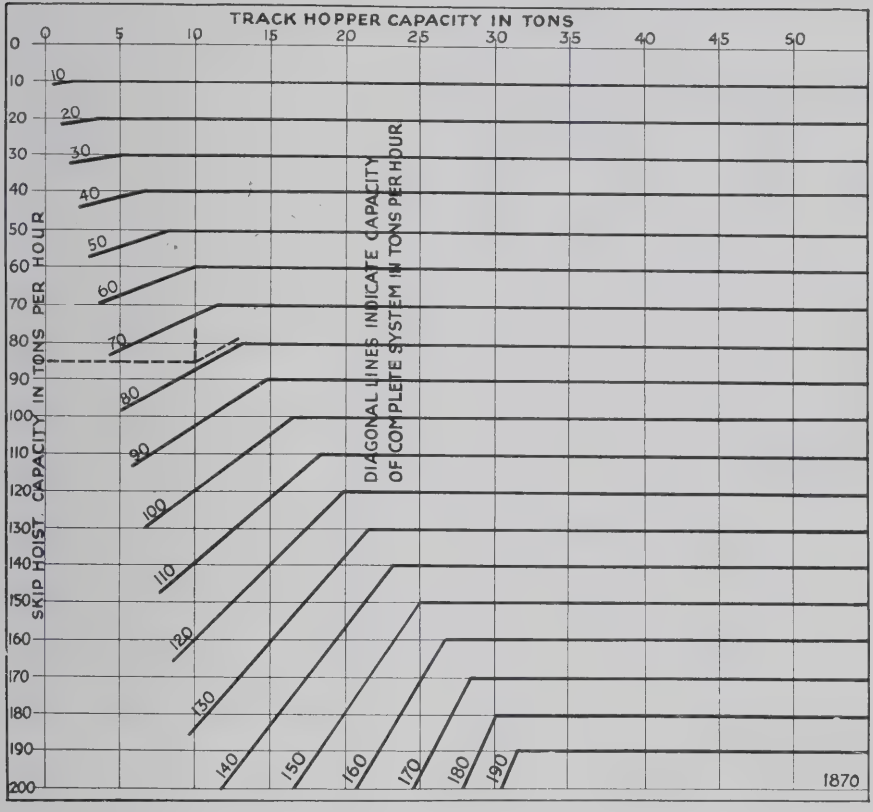
Assumptions—(Based on tests)

Minimum M for standard 50-ton car = 20 minutes
Minimum M for standard 100-ton car = 30 minutes
Minimum D for either size car = 10 minutes

M, when determined by track hopper and skip hoist capacity (this is always the governing value of M) equals $\frac{60\,(R-T)}{C}$

S, or capacity of complete system in tons per hour, equals $\frac{60R}{M+D}$

The desirable track hopper is one whose capacity in tons is slightly larger than one-sixth of the tons per hour of the skip hoist. Capacity of system will then equal the capacity of the skip hoist.

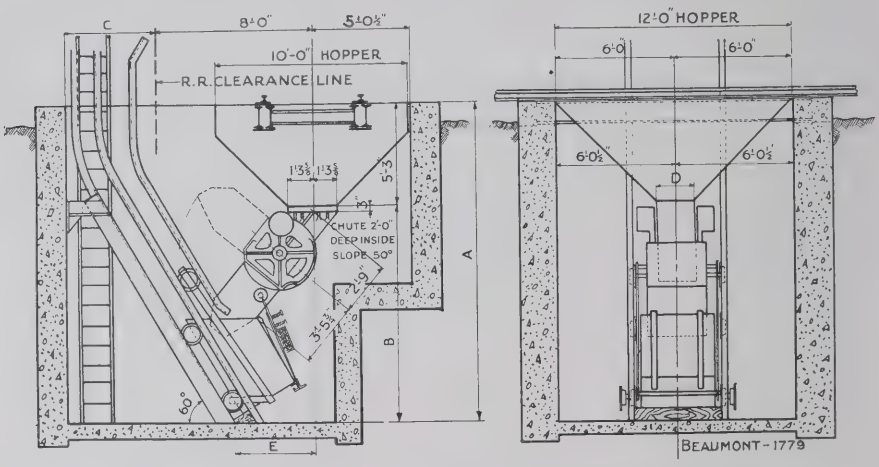


To Find Size Track Hopper Required with 50-ton Railroad Car

ENTER the chart at the left, knowing the skip hoist capacity required, follow this capacity line to its intersection with the nearest standard track hopper in tons capacity. The capacity of the complete system is then read from the diagonal lines at this intersection point.

EXAMPLE: With a skip hoist capacity of 85 tons per hour and a 10-ton track hopper, the capacity of the complete system will be about 78 tons per hour.

NOTE: 100 tons per hour is the maximum that can be unloaded from one 50-ton car over a single track hopper. For greater capacities, use two track hoppers or one big hopper with double tracks.



No. 1—10-foot by 12-foot Track Hopper

For Single Skip Hoist

Water Capacity Bucket Cubic Feet	20	40	60	80	100
A	14′ 6″	16′ 0″	17′ 4″	17′ 4″	18′ 1″
B	9′ 3″	10′ 9″	12′ 1″	12′ 1″	12′10″
C	3′ 7″	4′ 6″	4′ 6″	5′ 4″	5′ 4″
D	2′ 0″	2′ 0″	2′ 0″	3′ 0″	3′ 0″
E	4′ 4″	4′ 7″	3′10″	4′ 9″	4′ 3″

Specifications

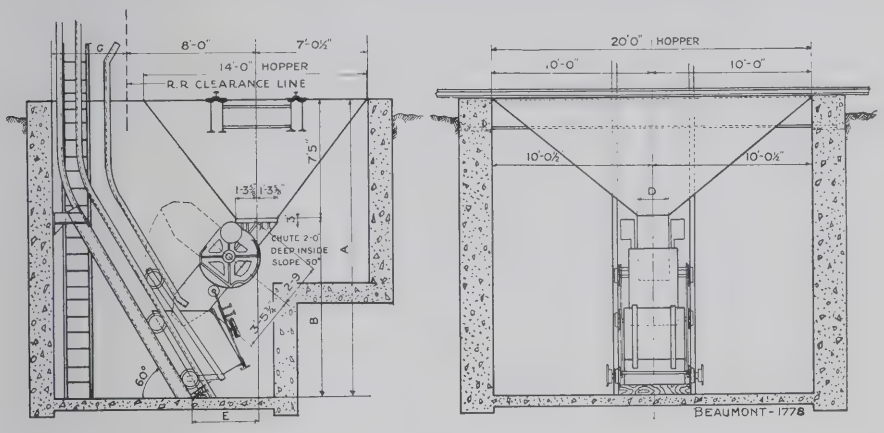
Track Girders

CONSIST of a pair of girders, each built up of two 15-inch 42.9-pound I-beams and ⅜-inch cover plate. Girders are fitted with end bearing plates and two 9-inch 13¼-pound channel spacers to hold them to gauge. Rails are secured to the girders by "island" plates. If the above specified girders are not approved by the railroad the price is subject to adjustment.

Track Hopper

Is 10 feet by 12 feet in plan, a size sufficient to receive coal from both doors of a hopper bottom car, and will discharge a 24-inch diameter lump. It will be constructed of ¼-inch steel plate stiffened with angles. Minimum valley slope is 35 degrees to insure self cleaning. All shop rivets and field bolts will be flat head inside of hopper. Hopper is suspended from the track girders by substantial bolts and cast washers.

When used with Cable Drag Scraper System see pages 154 and 155



No. 2—14-foot by 20-foot Track Hopper

For Single Skip Hoist

Water Capacity Bucket, Cu. Ft.	20	40	60	80	100	125	150	175	200
A	16′ 8″	18′ 2″	19′ 6″	19′ 6″	20′ 3″	20′ 6″	21′ 3″	21′ 3″	21′11″
B	9′ 3″	10′ 9″	12′ 1″	12′ 1″	12′10″	13′ 1″	13′10″	13′10″	14′ 6″
C	3′ 7″	4′ 5″	4′ 5″	5′ 4″	5′ 4″	6′ 0″	6′ 0″	6′ 6″	6′ 6″
D	2′ 0″	2′ 0″	2′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″
E	4′ 4″	4′ 7″	3′10″	4′ 9″	4′ 3″	4′10″	4′ 5″	5′ 0″	4′ 7″

Specifications

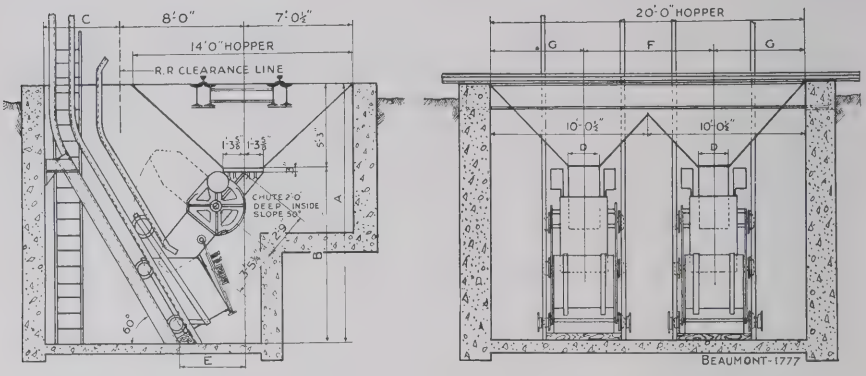
Track Girders

CONSIST of a pair of girders, each built up of two 24-inch 80-pound I-beams and 7/16-inch cover plate. Girders are fitted with end bearing plates and 15-inch by 33.7-pound channel spacers to hold them to gauge. Rails are secured to the girders by "island" plates. If these girders are not approved by the railroad the price is subject to adjustment.

Track Hopper

Is 14 feet by 20 feet in plan and will discharge a 24-inch diameter lump. Hopper is built of ¼-inch steel plate stiffened with angles. Flat head rivets are used inside the hopper. It is suspended from the track girders by substantial bolts and cast washers. Minimum valley slope of hopper is 35 degrees to insure self cleaning.

When used with Cable Drag Scraper see pages 154 and 155



No. 3—14-foot by 20-foot Track Hopper

For Balanced Skip Hoists

Water Capacity Bucket, Cu. Ft.	40	60	80	100	125	150	175	200
A . . .	16′ 0″	17′ 4″	17′ 4″	18′ 1″	18′ 4″	19′ 1″	19′ 1″	19′ 9″
B . . .	10′ 9″	12′ 1″	12′ 1″	12′10″	13′ 1″	13′10″	13′10″	14′ 6″
C . . .	4′ 6″	4′ 6″	5′ 4″	5′ 4″	6′ 0″	6′ 0″	6′ 6″	6′ 6″
D . . .	2′ 0″	2′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″
E . . .	4′ 7″	3′10″	4′ 9″	4′ 3″	4′10″	4′ 5″	5′ 0″	4′ 7″

Specifications

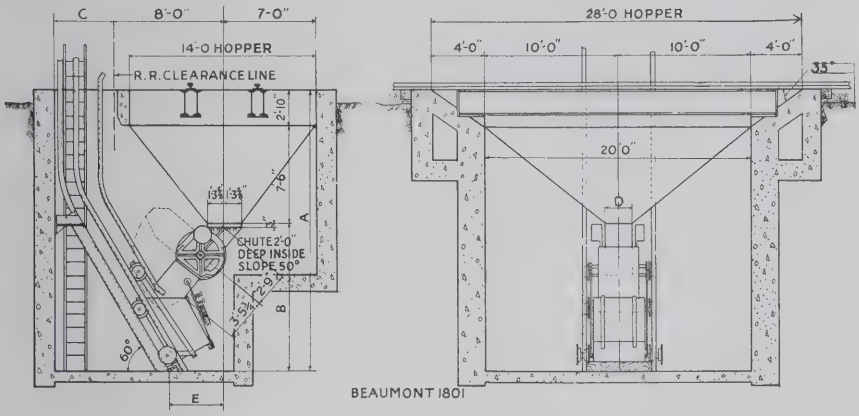
Track Girders

CONSIST of a pair of girders, each built up of two 24-inch 80-pound I-beams and 7/16-inch cover plate. Girders are fitted with end bearing plates and 15-inch by 33.7-pound channel spacers to hold them to gauge. Rails are secured to the girders by "island" plates. If these girders are not approved by the railroad the price is subject to adjustment.

Track Hopper

Is 14 feet by 20 feet in plan and will discharge a 24-inch diameter lump. It is built of ¼-inch steel plate stiffened with angles. Flat head rivets are used inside the hopper. It is supported from the track girders by substantial bolts and cast washers. Minimum valley slope of hopper is 35 degrees to insure self cleaning.

When used with Cable Drag Scraper see pages 154 and 155



No. 4—14-foot by 28-foot Track Hopper

For Single Skip Hoist

Water Capacity Bucket, Cu. Ft.	20	40	60	80	100	125	150	175	200
A	19′ 7″	21′ 1″	22′ 5″	22′ 5″	23′ 2″	23′ 5″	24′ 2″	24′ 2″	24′ 10″
B	9′ 3″	10′ 9″	12′ 1″	12′ 1″	12′ 10″	13′ 1″	13′ 10″	13′ 10″	14′ 6″
C	3′ 7″	4′ 6″	4′ 6″	5′ 4″	5′ 4″	6′ 0″	6′ 0″	6′ 6″	6′ 6″
D	2′ 0″	2′ 0″	2′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″
E	4′ 4″	4′ 7″	3′ 10″	4′ 9″	4′ 3″	4′ 10″	4′ 5″	5′ 0″	4′ 7″

Specifications

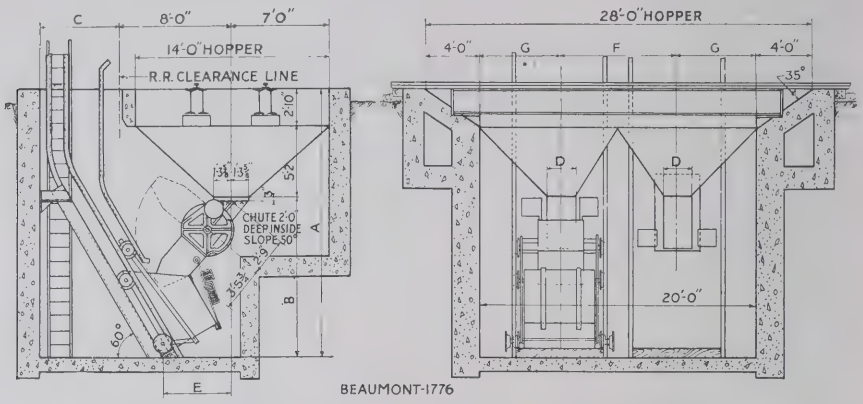
Track Girders

CONSIST of a pair of girders, each built up of two 24-inch by 80-pound I-beams and 7/16-inch cover plate. Track girders are fitted with end bearing plates and 15-inch by 33.7-pound channel spacers to hold them to gauge. Rails are secured to the girders by "island" plates. If these girders are not approved by the railroad the price is subject to adjustment.

Track Hopper

Is 14 feet by 28 feet in plan and will discharge a 24-inch diameter lump. It is built of 1/4-inch steel plate, stiffened with angles. Flat head rivets are used inside the hopper. Hopper is supported at the ends and sides from bolts set in the concrete pit. Part of the hopper will be formed in the concrete pit, as shown in the drawing above. Minimum valley slope is 35 degrees to insure self cleaning.

When used with Cable Drag Scraper see pages 154 and 155



No. 5—14-foot by 28-foot Track Hopper

For Balanced Skip Hoist

Water Capacity Bucket, Cu. Ft.	60	80	100	125	150	175	200
A	20′ 1″	20′ 1″	20′10″	21′ 1″	21′ 6″	21′10″	22′ 6″
B	12′ 1″	12′ 1″	12′10″	13′ 1″	13′10″	13′10″	14′ 6″
C	4′ 6″	5′ 4″	5′ 4″	6′ 0″	6′ 0″	6′ 6″	6′ 6″
D	2′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″
E	3′10″	4′ 9″	4′ 3″	4′10″	4′ 5″	5′ 0″	4′ 7″
F	7′ 1″	8′ 4″	8′ 4″	9′ 1″	9′ 1″	9′10″	9′10″
G	6′ 5½″	5′10″	5′10″	5′ 5½″	5′ 5½″	5′ 1″	5′ 1″

Specifications

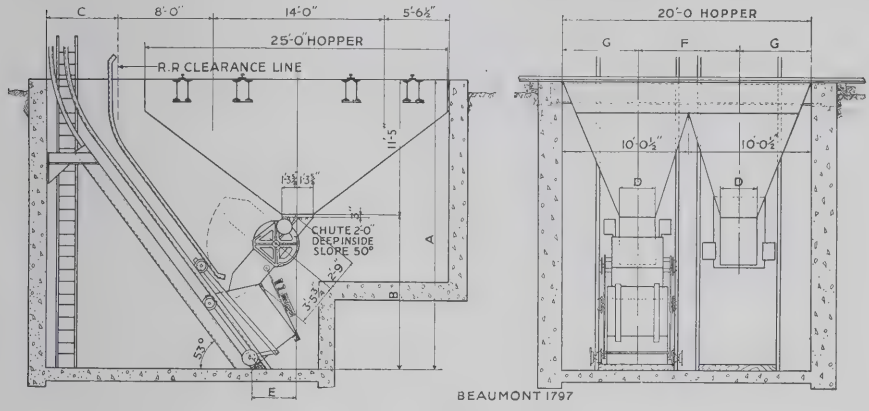
Track Girders

CONSIST of a pair of girders, each built up of two 24-inch by 80-pound I-beams and 7/16-inch cover plate. Track girders are fitted with end bearing plates and 15-inch by 33.7-pound channel spacers to hold them to gauge. Rails are secured to the girders by "island" plates. If these girders are not approved by the railroad the price is subject to adjustment.

Track Hopper

Is 14 feet by 28 feet in plan and will discharge a 24-inch diameter lump. It is built of ¼-inch steel plate, stiffened with angles. Flat head rivets are used inside the hopper. Hopper is supported at the ends and sides from bolts set in the concrete pit. Part of the hopper will be formed in the concrete pit, as shown in the drawing above. Minimum valley slope is 35 degrees to insure self cleaning.

When used with Cable Drag Scraper see pages 154 and 155



No. 6—25-foot by 20-foot Track Hopper

Double Track—Balanced Skips

Water Capacity Bucket, Cu. Ft.	60	80	100	125	150	175	200
A	23′ 6″	23′ 6″	24′ 3″	24′ 6″	25′ 3″	25′ 3″	25′11″
B	12′ 1″	12′ 1″	12′10″	13′ 1″	13′10″	13′10″	14′ 6″
C	4′ 6″	5′ 4″	5′ 4″	6′ 0″	6′ 0″	6′ 6″	6′ 6″
D	2′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″
E	3′10″	4′ 9″	4′ 3″	4′10″	4′ 5″	5′ 0″	4′ 7″
F	7′ 1″	8′ 4″	8′ 4″	9′ 1″	9′ 1″	9′10″	9′10″
G	6′ 5½″	5′10″	5′10″	5′ 5½″	5′ 5½″	5′ 1″	5′ 1″

Specifications

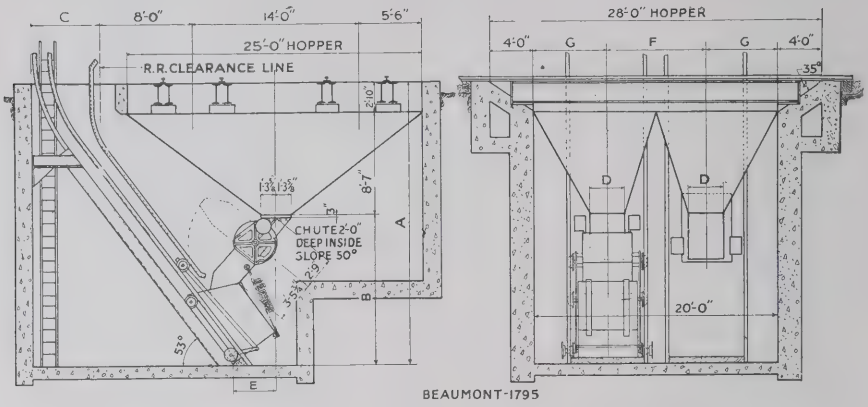
Track Girders

CONSIST of four girders, each built up of two 24-inch by 80-pound I-beams and 7/16-inch cover plate. Track girders are fitted with end bearing plates and 15-inch by 33.7-pound channel spacers to hold them to gauge. Rails are secured to the girders by "island" plates. If these girders are not approved by the railroad the price is subject to adjustment.

Track Hopper

Is 25 feet by 20 feet in plan and will discharge a 24-inch diameter lump. It is built of 3/8-inch steel plate; stiffened with angles. Flat head rivets are used inside the hopper. It is supported from the track girders by substantial bolts and cast washers. Minimum valley slope of hopper is 35 degrees to insure self cleaning.

When used with Cable Drag Scraper see pages 154 and 155



No. 7—25-foot by 28-foot Track Hopper Double Tracks

For Balanced Skip Hoist

Water Capacity Bucket, Cu. Ft.	60	80	100	125	150	175	200
A	23′ 6″	23′ 6″	24′ 3″	24′ 6″	25′ 3″	25′ 3″	25′11″
B	12′ 1″	12′ 1″	12′10″	13′ 1″	13′10″	13′10″	14′ 6″
C	4′ 6″	5′ 4″	5′ 4″	6′ 0″	6′ 0″	6′ 6″	6′ 6″
D	2′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″	3′ 0″
E	3′10″	4′ 9″	4′ 3″	4′10″	4′ 5″	5′ 0″	4′ 7″
F	7′ 1″	8′ 4″	8′ 4″	9′ 1″	9′ 1″	9′10″	9′10″
G	6′ 5½″	5′10″	5′10″	5′ 5½″	5′ 5½″	5′ 1″	5′ 1″

Specifications

Track Girders

CONSIST of four girders, each built up of two 24-inch by 80-pound I-beams and 7/16-inch cover plate. Track girders are fitted with end bearing plates and 15-inch by 33.7-pound channel spacers to hold them to gauge. Rails are secured to the girders by "island" plates. If these girders are not approved by the railroad the price is subject to adjustment.

Track Hopper

Is 25 feet by 28 feet in plan and will discharge a 24-inch diameter lump. It is built of 3/8-inch steel plate, stiffened with angles. Flat head rivets are used inside the hopper. Hopper is supported at the ends and sides by bolts set in the concrete pit. Part of the hopper will be formed in the concrete pit, as shown in the drawing above. Minimum valley slope of hopper is 35 degrees to insure self cleaning.

When used with Cable Drag Scraper see pages 154 and 155

Rotary Car Dumpers for Standard Gauge Gondolas and Hopper Cars

WHERE it is required to unload coal at high speed we recommend and use the Rotary Car Dumper, illustrated and described in the following pages.

With the equipment as shown, operated by a motor, one man can easily handle the loaded and empty cars and operate the car dumper at the rate of ten cars per hour. This eliminates all the difficulties and expense which have previously resulted from the dependency on hopper-bottom cars. It is generally recognized that the hopper-bottom railroad cars are far from ideal, generally requiring a large amount of labor to clean the cars up thoroughly when handling a considerable tonnage of material. In addition to this, hopper-bottom cars are not always easy to secure and shipments are frequently held up due to the inability to secure this type of car. The Rotary Car Dumper, of course, handles either hoppers or gondolas with equal facility. The savings to be secured as compared to the hopper-bottom cars are generally so great that at a plant handling from 500 tons a day upward, the car dumper will save the entire cost in less than one year.

The first cost of the car dumper is very little more than a traveling crane or locomotive crane. The cost of operation of the Rotary Car Dumper is very much less. The capacity is much greater. The Rotary Car Dumper is very much easier on the cars than any crane operating with a clam-shell bucket, eliminating for this reason the frequent expense caused by damage to cars when unloading with a crane. It also eliminates the labor usually required to clean up the cars after a clam-shell bucket, since the car dumper turns the cars upside down, cleaning them thoroughly.

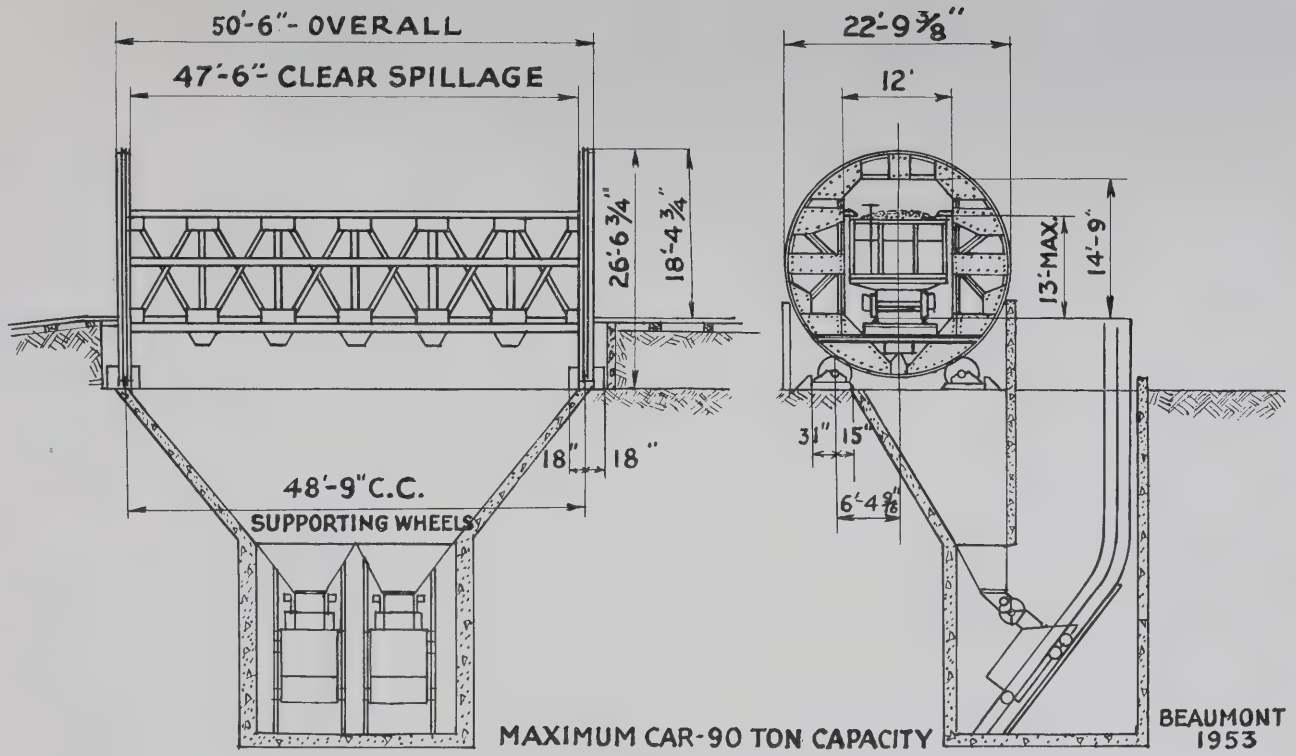
The car dumper is mounted over either a single- or double-track hopper, depending upon the depth which can be secured, or where depth is objectionable the hopper may be split into compartments or the track raised.

The operator spots the loaded cars in the car dumper either by means of a car puller or by dropping them in with a brake under gravity. He then throws his control valve or electrical controller to turn the car upside down and bring it back to the upright position. This requires about sixty seconds. Since the tracks always line up accurately at the completion of rotation, he merely allows the empty car to run out on the empty storage track and runs in another load, repeating the operation.

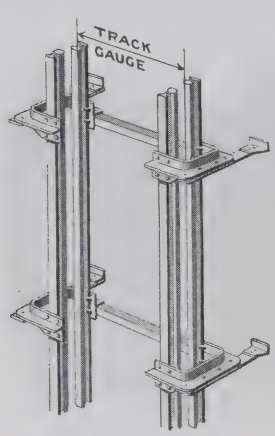
Rotary Car Dumper

Loaded Car Ready for Dumping

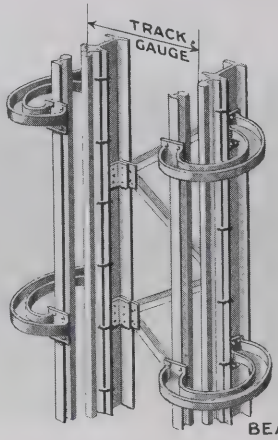
Car in Dumping Position, Coal Quickly and Completely Discharged



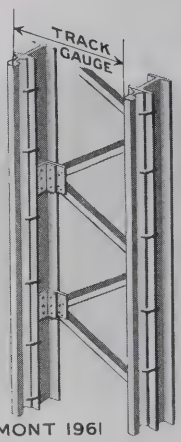
Standard Rotary Car Dumper



Vertical Type



Inclined Guarded Type



Inclined Type

Skip Guides—Open Type

Specifications for 60- to 200-Cubic Foot Skips

Vertical Type

CONSIST of four tee rails (listed below) securely braced and held to gauge at proper intervals by steel yokes, which hold the guides true to gauge. These yokes are tied in to the bunker columns and pit walls. The Vertical Type are also used on inclines down to 80 degrees from the horizontal.

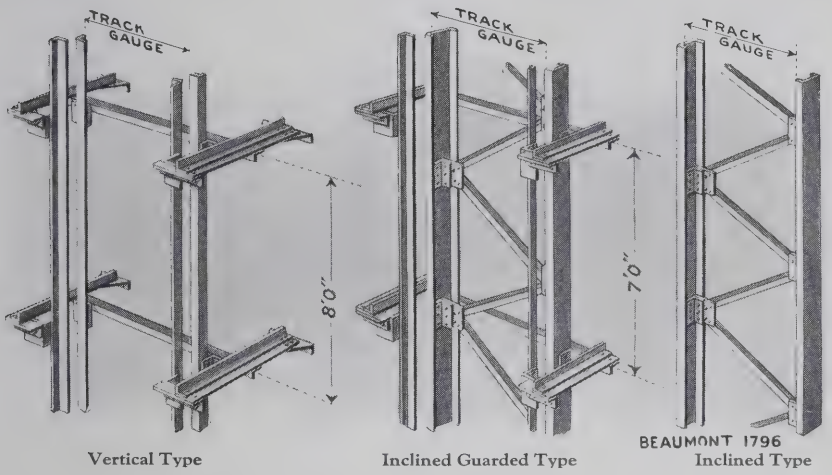
Inclined Guarded Type

Consist of two steel I-beams with tee rail track and tee rail hold-down guard. Beams are securely laced together and hold-down rails are yoked to the beams to hold them both true to gauge, and are braced to bunker columns by a steel bent. Inclined Guarded Type are used on inclines from 65 to 80 degrees from the horizontal.

Inclined Type

Consist of a pair of beams, with tee rail track attached, securely laced together to hold them true to gauge and are braced from the bunker columns by steel bents. Inclined Type are used on inclines from 35 to 65 degrees.

Water Capacity Bucket . . . Cu. Ft.	60	80	100	125	150	175	200
Tee Rail Tracks . . . Pounds	30	40		50		60	



Vertical Type | Inclined Guarded Type | Inclined Type

Skip Guides—Open Type

Specifications for 20- and 40-Cubic Foot Skips

Vertical Type

CONSIST of four 3-inch by 3-inch by 5/16-inch angles securely braced together at proper intervals by steel yokes, which hold the guides true to gauge. These yokes are tied in to the bunker columns and to the pit walls. Guides are field bolted. The Vertical Type are also used on inclines down to 80 degrees from the horizontal.

Inclined Guarded Type

Consist of two 7-inch by 9.8-pound steel channels with 2½-inch by 2½-inch by ¼-inch hold-down angles. Channels are securely laced together and hold-down angles are yoked to the channels to hold them both true to gauge, and are braced from bunker columns by a steel bent. Guides are field bolted. Inclined Guarded Type are used on inclines from 65 to 80 degrees from the horizontal.

Inclined Type

Consist of a pair of 10-inch by 15.3-pound steel channels, securely laced together to hold them true to gauge and are braced from the bunker columns by steel bents. Guides are field bolted. Inclined Type are used on inclines from 35 to 65 degrees.

Water Capacity Bucket . . . Cu. Ft.	20	40
Track Gauge	4′ 7″	5′ 6″

Skip Guides—Type "C" Skip

Specifications

CONSIST of six 3-inch by 3-inch by 5/16-inch angles securely braced together at proper intervals by steel yokes, which hold the guides true to gauge. These yokes are tied in to the bunker columns and to the pit walls. Guides are field bolted.

Inclined Discharge Superstructure
Type "C" Skip

At the discharge point the skip guides are supported by a well-braced steel structure, which also supports the head sheaves. This structure is attached to the top of the storage bunker or to any existing building, and is field riveted.

Hinged Cover

The discharge opening is covered by a No. 10 steel plate cover, which is opened automatically by the skip bucket when it ascends and closes when the bucket descends. The cover is fitted with angle stiffeners and has a rod type hinge.

Inclined Discharge Superstructure

AT the discharge point the skip guides are supported by a well-braced steel structure, which also supports the head sheaves. This structure is attached to the top of the storage bunker or to any existing building, and is field riveted.

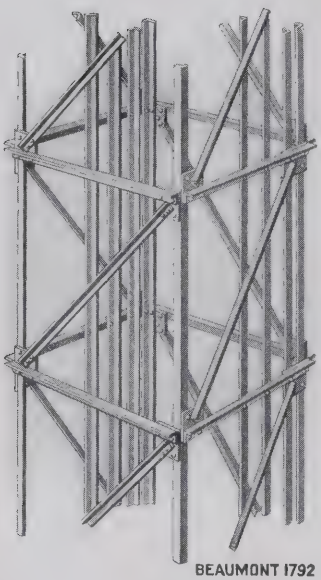
Any one of the three types of guides shown on pages 68 and 69 may be used to lead up to this discharge point.

Hinged Cover

The discharge opening is covered by a No. 10 steel plate cover, which is opened automatically by the skip bucket when it ascends and closes when the bucket descends.

The cover is fitted with angle stiffeners and has a rod type hinge.

Vertical Towers for Single Skips



Tower for Unbalanced Skip Hoist

Tower for Unbalanced Skip

SKIP guides consist of six angles for 20- and 40-cubic foot skips, and six tee rails for 60-cubic foot and larger. They are attached to the inside of a well-braced steel tower, which is designed according to the American Bridge specifications recommended in the Carnegie Pocket Companion.

Head sheaves will be supported by head beams built of steel I-beams.

Tower is braced to building or bunker at suitable intervals.

Skip Guides

Water Capacity Bucket, Cubic Feet								
20	40	60	80	100	125	150	175	200
3″ x 3″ x 5/16″		30-lb. T. Rls.	40-lb. Tee Rails		50-lb. Tee Rails		60-lb. Tee Rails	

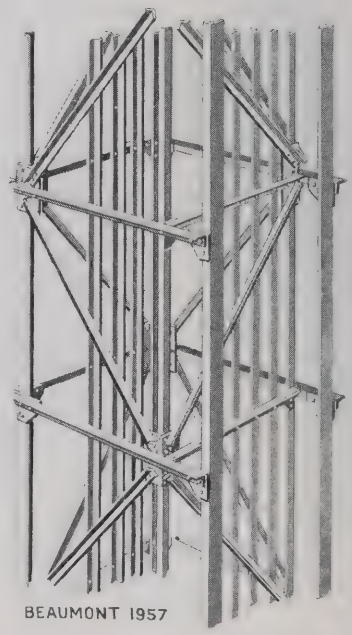
Tower for Counterweighted Skip

Skip guides consist of six tee rails attached to the inside of a well-braced steel tower, which is designed according to the American Bridge specifications recommended in the Carnegie Pocket Companion. On 40-cubic foot skips six angles are used for guides.

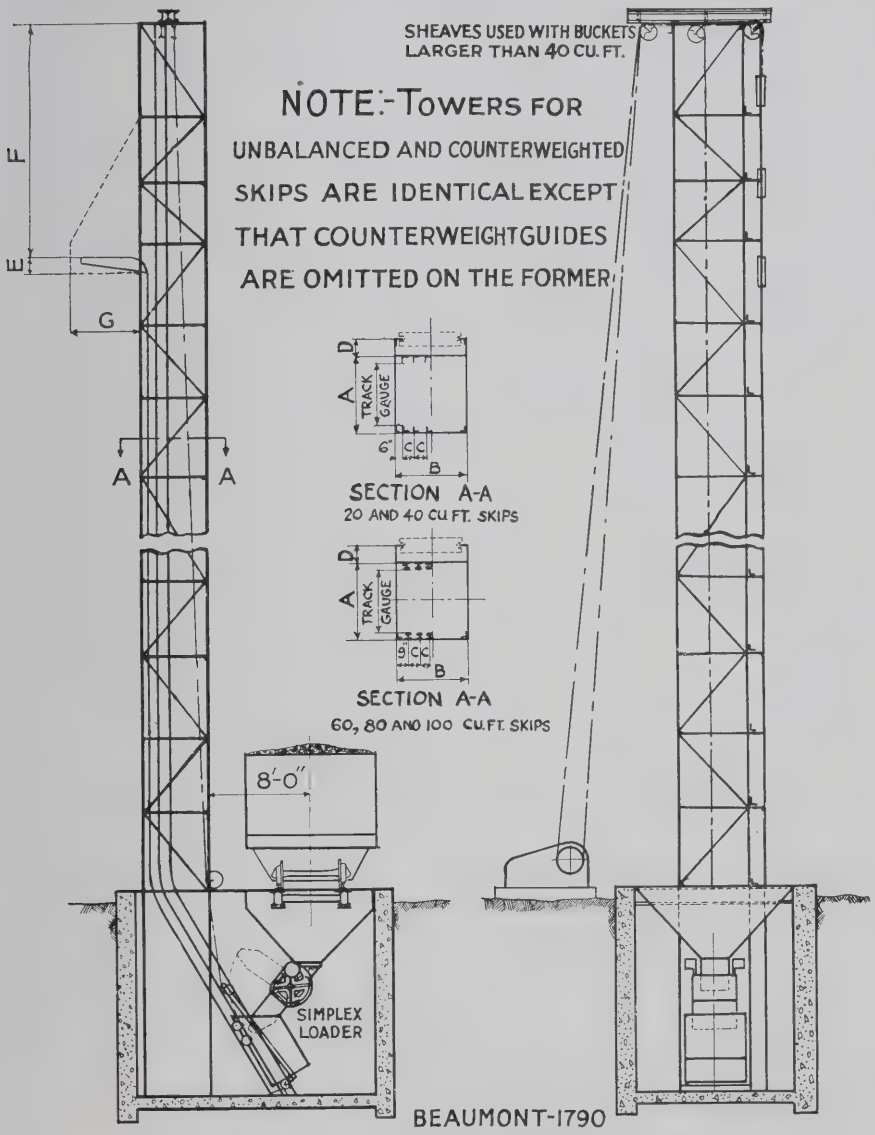
Counterweight guides are 5-inch by 3½-inch by ⅜-inch angles.

Head sheaves will be supported by head beams built of steel I-beams.

Tower is braced to building or bunker at suitable intervals.

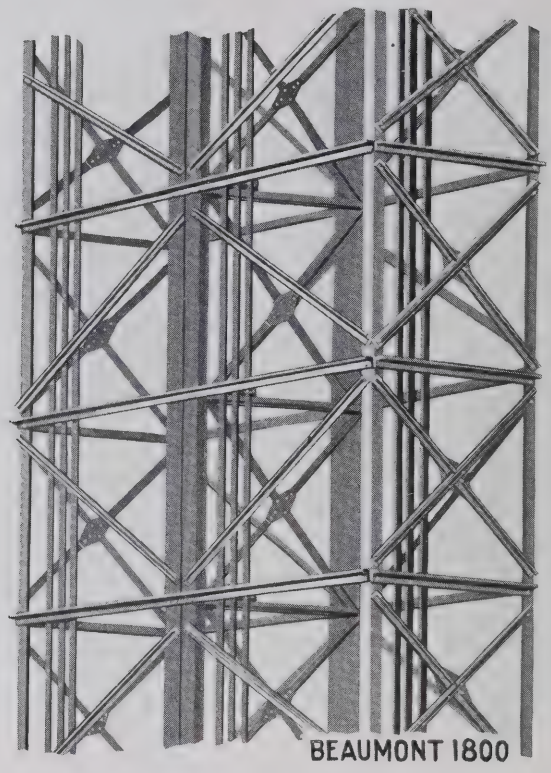


Tower for Counterweighted Skip Hoist



Vertical Towers for Single Skips

Water Capacity Bucket . Cu. Ft.	20	40	60	80	100
A	5′ 1″	6′ 0″	6′ 0¼″	6′ 11″	6′ 11″
B	3′ 5″	4′ 9″	5′ 4″	6′ 0″	6′ 0″
C	6⅞″	10⅞″	12¼″	14⅜″	14⅜″
D	.....	8″	8″	9″	9″
E	1′ 0″	1′ 3″	1′ 9″	2′ 0″	2′ 0″
F	16′ 7″	20′ 5″	22′ 8″	20′ 5″	21′ 8″
G	3′ 3″	4′ 6″	5′ 6″	5′ 9″	6′ 9″
Track Gauge	4′ 7″	5′ 6″	5′ 6″	6′ 4″	6′ 4″
Guides	3 x 3″ Angles	3 x 3″ Angles	30-lb. Tees	40-lb. Tee Rails	



Vertical Tower for Balanced Skip

Specifications

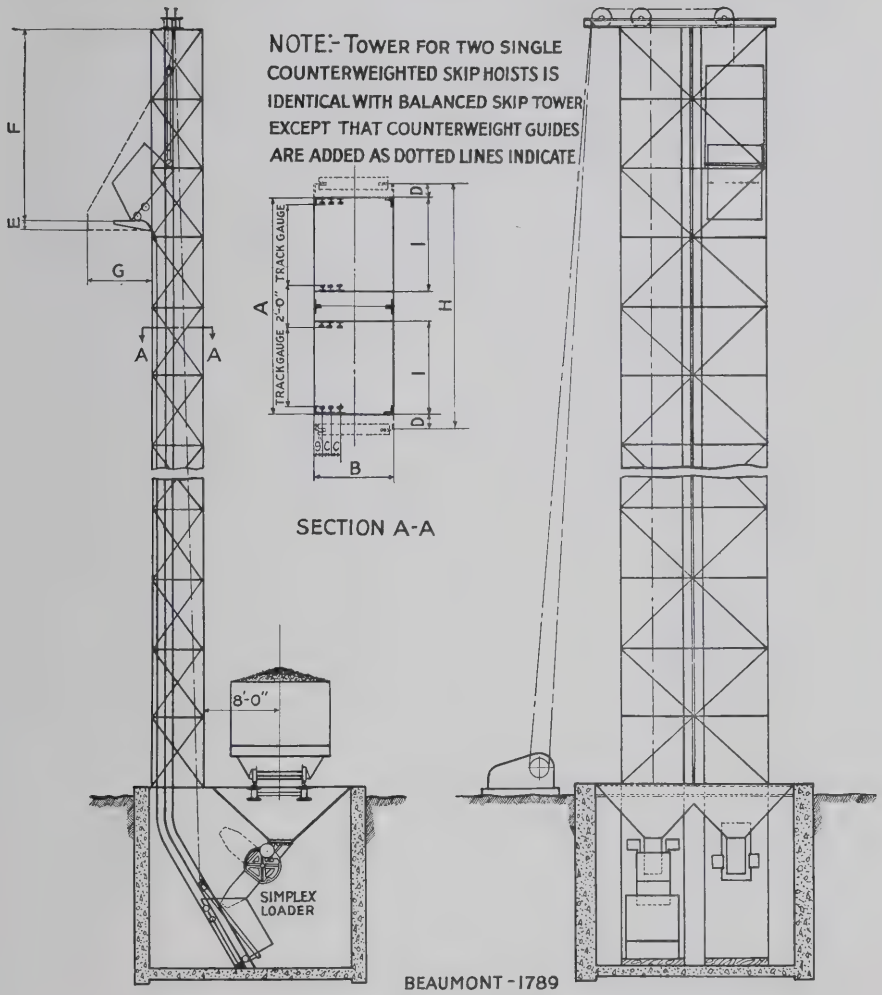
SKIP guides consist of twelve tee rails fastened to the inside of a well-braced steel tower, which is designed according to the American Bridge specifications recommended in the Carnegie Pocket Companion.

With two single counterweighted skip hoists running in a single tower, counterweight guides are attached to each end of the tower. These guides are attached to the horizontal struts, which in this case are extended. Counterweight guides are 5-inch by 3½-inch by ⅜-inch angles. Head sheaves will be supported by head beams built of steel I-beams. Tower is braced to building or bunker at suitable intervals or is designed to be entirely self supporting.

Guide Angles

Water Capacity Bucket, Cubic Feet

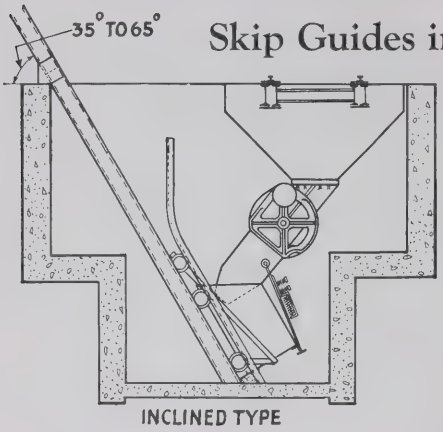
60	80	100	125	150	175	200
30-lb. Tee Rail	40-lb. Tee Rail		50-lb. Tee Rail		60-lb. Tee Rail	



Vertical Towers for Balanced Skips

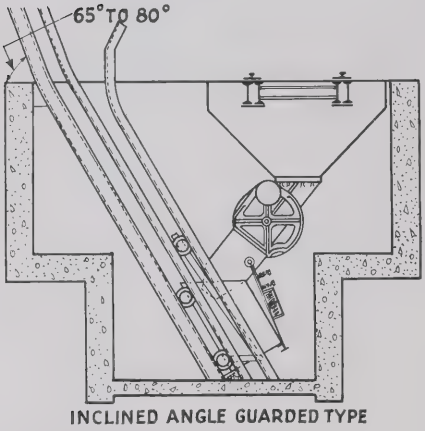
Water Capacity Bucket, Cu. Ft.	60	80	100	125	150	175	200
A . . .	13′ 6¼″	15′ 3″	15′ 3″	16′ 9¾″	16′ 9¾″	18′ 5″	18′ 5″
B . . .	5′ 4″	6′ 0″	6′ 0″	6′ 6″	6′ 6″	7′ 0″	7′ 0″
C . . .	12¼″	14⅜″	14⅜″	17⅝″	17⅝″	17¾″	17¾″
D. . . .	8″	9″	9″	10″	10″	11″	11″
E . . .	1′ 9″	2′ 0″	2′ 0″	2′ 0″	2′ 6″	2′ 6″	2′ 6″
F . . .	22′ 8″	20′ 5″	21′ 8″	22′ 6″	24′ 3″	24′ 9″	26′ 0″
G. . . .	5′ 6″	5′ 9″	6′ 9″	6′ 9″	7′ 9″	7′ 8″	8′ 4″
H. . . .	14′ 10¼″	16′ 9″	16′ 9″	18′ 5¾″	18′ 5¾″	20′ 3″	20′ 3″
I	6′ 0¼″	6′ 11″	6′ 11″	7′ 8¾″	7′ 8¾″	8′ 7″	8′ 7″
Track Gauge . .	5′ 6″	6′ 4″	6′ 4″	7′ 1″	7′ 1″	7′ 10″	7′ 10″
Guides.	30-lb. Tees	40-lb. Tee Rails		50-lb. Tee Rails		60-lb. Tee Rails	

Skip Guides in Track Hopper Pit



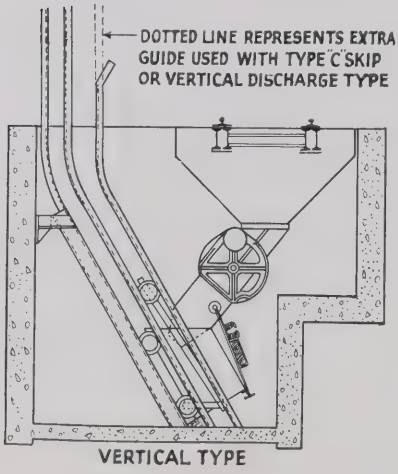
Inclined Type

NO hold-down guide is required for the bucket in the loading pit on inclined type guides, but a hold-down guide is used to hold the bucket bale out of the path of the descending loader chute. This guide is used only in the pit and does not continue for the full length of the skip runway. The angle of guides above ground (35 to 60 degrees) can never be more than 5 degrees greater than the loading angle of skip tracks, which is 60 degrees in a standard skip.



Inclined Guarded Type

A hold-down guide is used in the loading pit to hold the skip bucket bale on the inclined guarded type guides because the angle of the guides above ground is more near vertical than those in the pit. This hold-down guide is used only in the pit and does not continue for the full length of the skip runway.



Vertical Type

A hold-down guide is used in the loading pit to hold the skip bucket bale on vertical type guides because the angle of the guides above ground is vertical. This hold-down guide is used only in the pit and does not continue for the full length of the skip runway except on vertical discharge or Type "C" skips. In these cases the third guide is necessary for the full length of runway.

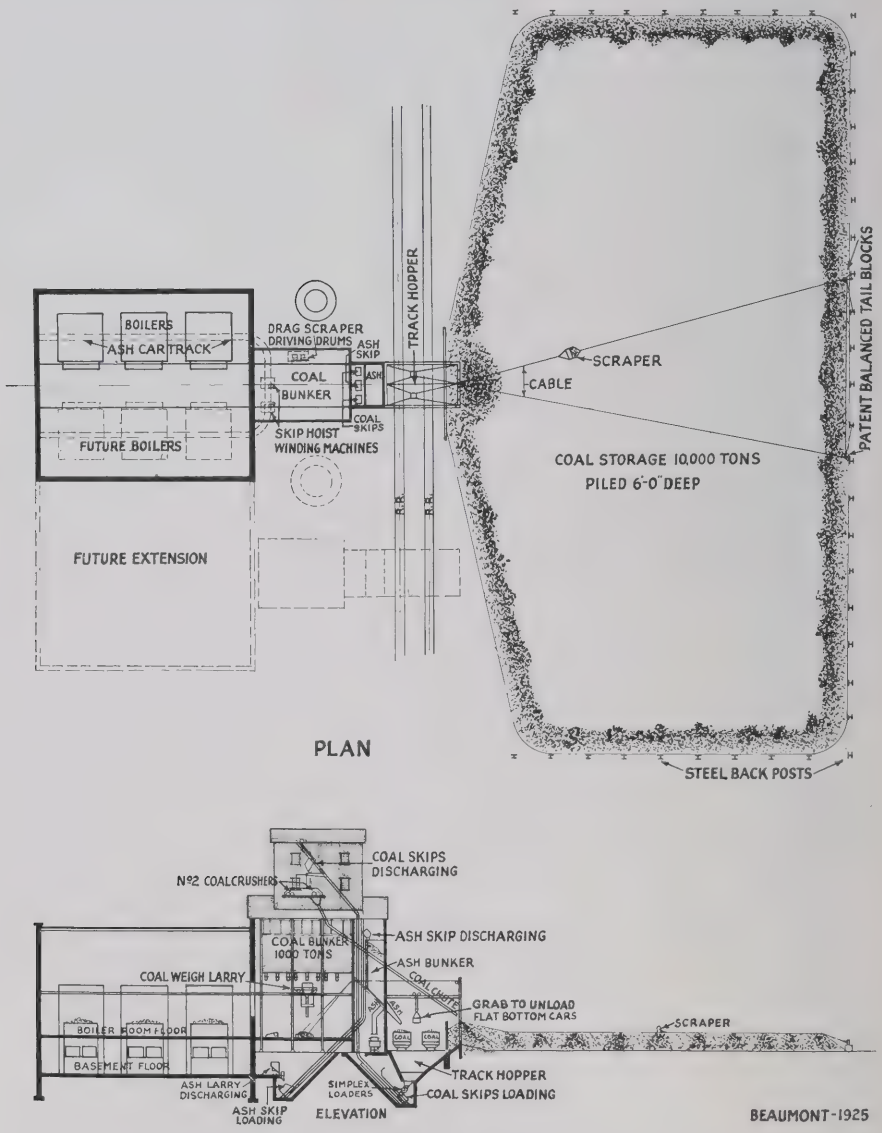
Note—No hold-down guide is used with manually loaded skips.

Beaumont Skip Hoist Capacities

In Tons Per Hour

	Manually Loaded					Simplex Loader								Type Skip and Material Handled
Water Capacity Bucket, Cu. Ft.	20	40	60	80	100	40	60	80	100	125	150	175	200	
50-ft. Lift . .	9½	19	28											Slow Speed Unbalanced Hoisting **ASHES** at 75 feet per minute
75-ft. Lift . .	7	14	22											
100-ft. Lift . .	5½	11½	17											
Motor H.P. Net	6¼	12½	19											
Winding Machine No. .	1	2	2											
50-ft. Lift . .	12½	25	38			43	65							Medium Speed Unbalanced Hoisting **ASHES** at 125 feet per minute
75-ft. Lift . .	10	20	30			32	48							
100-ft. Lift . .	8½	17	25			25	38							
125-ft. Lift . .						21	32							
150-ft. Lift . .						18	27							
Motor H.P. Net	10½	21	31½			25	37½							
Winding Machine No. .	2	2	2-A			2	2-A							
50-ft. Lift . .		32	48			53	80	105	127	166	194	230	254	Medium Speed Counter-weighted Hoisting **COAL** at 125 feet per minute
75-ft. Lift . .		25	38			39	59	78	94	122	143	169	188	
100-ft. Lift . .		21	32			31	47	62	75	97	114	134	150	
125-ft. Lift . .						26	39	51	62	80	94	111	124	
150-ft. Lift . .						22	33	44	53	69	80	95	106	
Motor H.P. Net		8½	12½			9	13½	18	22½	28	33½	39	45	
Winding Machine No. .		1	2			1	2	2	2	2	3	4	4-B	
50-ft. Lift . .						68	103	135	164	214	250	296	328	High Speed Counter-weighted Hoisting **COAL** at 250 feet per minute
75-ft. Lift . .						56	84	110	134	175	204	240	268	
100-ft. Lift . .						47	71	93	113	147	172	203	226	
125-ft. Lift . .						41	61	80	98	127	149	176	196	
150-ft. Lift . .						36	54	71	86	112	131	155	172	
175-ft. Lift . .						32	48	63	77	100	117	138	154	
200-ft. Lift . .						29	44	57	70	90	106	125	139	
Motor H.P. Net						18	27	36	45	55	67	79	90	
Winding Machine No. .						2	2	2-A	2-A	3	3-A	4	4-B	
50-ft. Lift . .							206	270	328	428	530	592	656	High Speed Balanced Hoisting **COAL** at 250 feet per minute
75-ft. Lift . .							168	220	268	350	408	480	536	
100-ft. Lift . .							142	186	226	294	344	406	452	
125-ft. Lift . .							122	160	196	254	298	352	392	
150-ft. Lift . .							108	142	172	224	262	310	344	
175-ft. Lift . .							96	126	154	200	234	276	308	
200-ft. Lift . .							88	114	140	180	212	250	278	
Motor H.P. Net							44	58	73	91	109	127	145	
Winding Machine No. .							2-A	3	3-A	3-A	4-A	4-A	4-A	

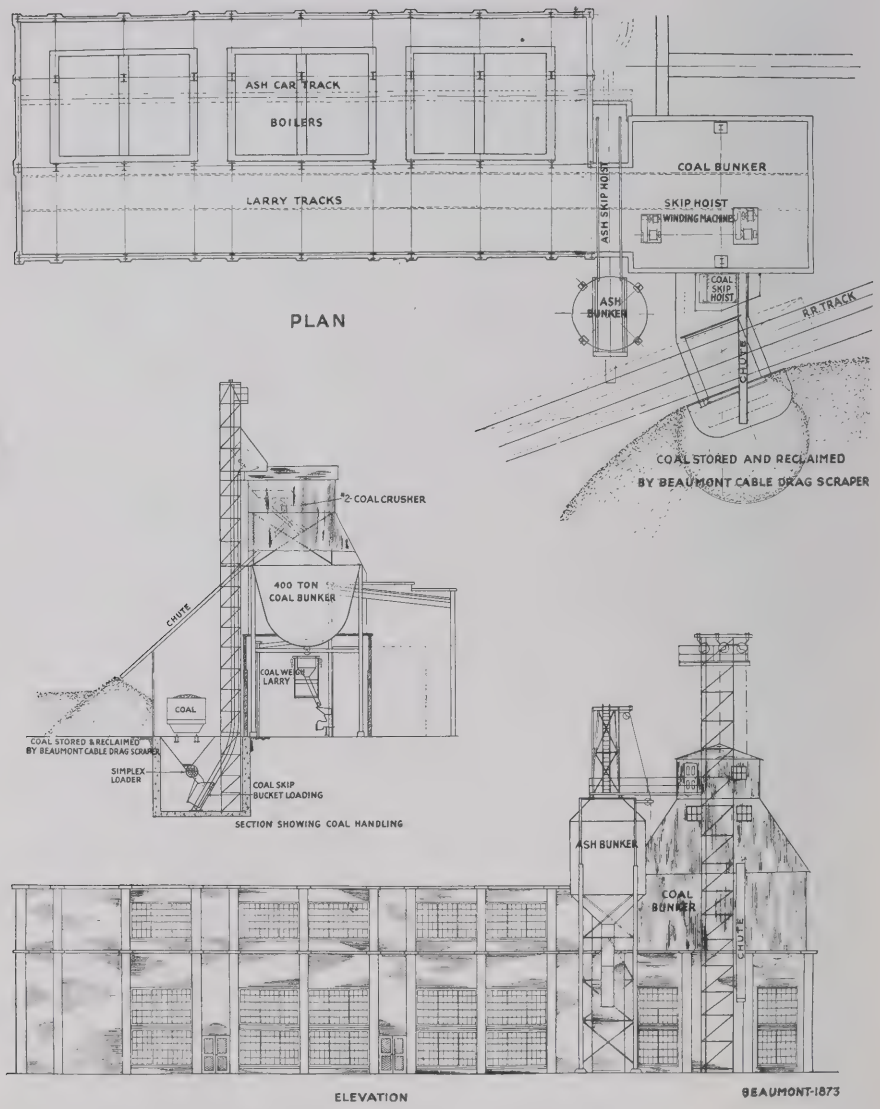
NOTE: Figures given are for net tons of 2000 pounds. Weight of ashes assumed at 40 pounds per cubic foot in calculating capacities, but 50 pounds per cubic foot in calculating motor horsepower. Coal is assumed to weigh 50 pounds per cubic foot. See page 250 for formulas on Skip Hoist, capacities and horsepower.



KANSAS GAS & ELECTRIC CO., Neosho Steam Station, Service, Kansas
One of the Electric Bond & Share Co's. Plants
F. H. Rosencrants, Engineer

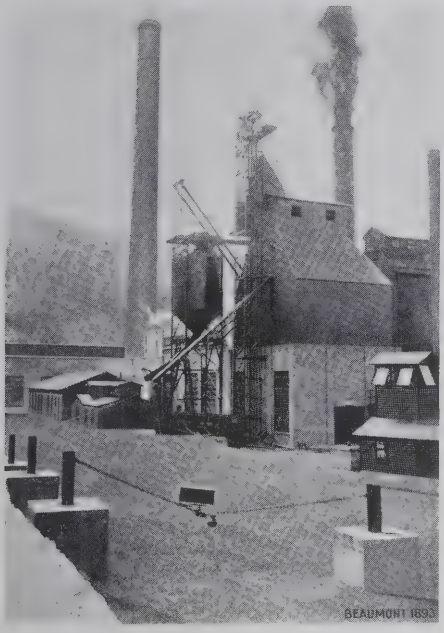
Complete super-central coal and ash handling system, including high-speed balanced skip hoist for coal, slow-speed skip for ashes, No. 2 coal crusher with drop forged teeth, suspended steel coal bunker, No. 10-MDCO coal weigh larry, complete drag scraper system, etc.

KANSAS GAS & ELECTRIC CO., Service, Kansas



CHERRY RIVER PAPER CO., Richwood, W. Va.
Jos. H. Wallace & Co., Engineers

COMPLETE super-central coal and ash handling system, including 400-ton steel suspension coal bunker, filled by a high-speed counterweighted skip hoist. No. 2 coal crusher over bunker and 2-MDCO coal weigh larry to distribute coal to stokers. Ground storage by No. 1 cable drag scraper. Separate ash skip hoist and circular ash bunker.



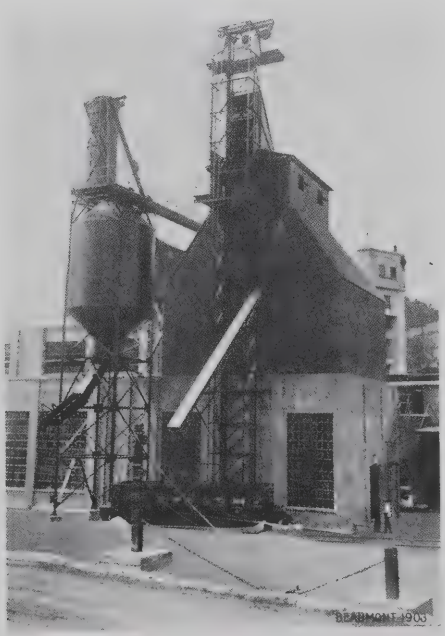
General View

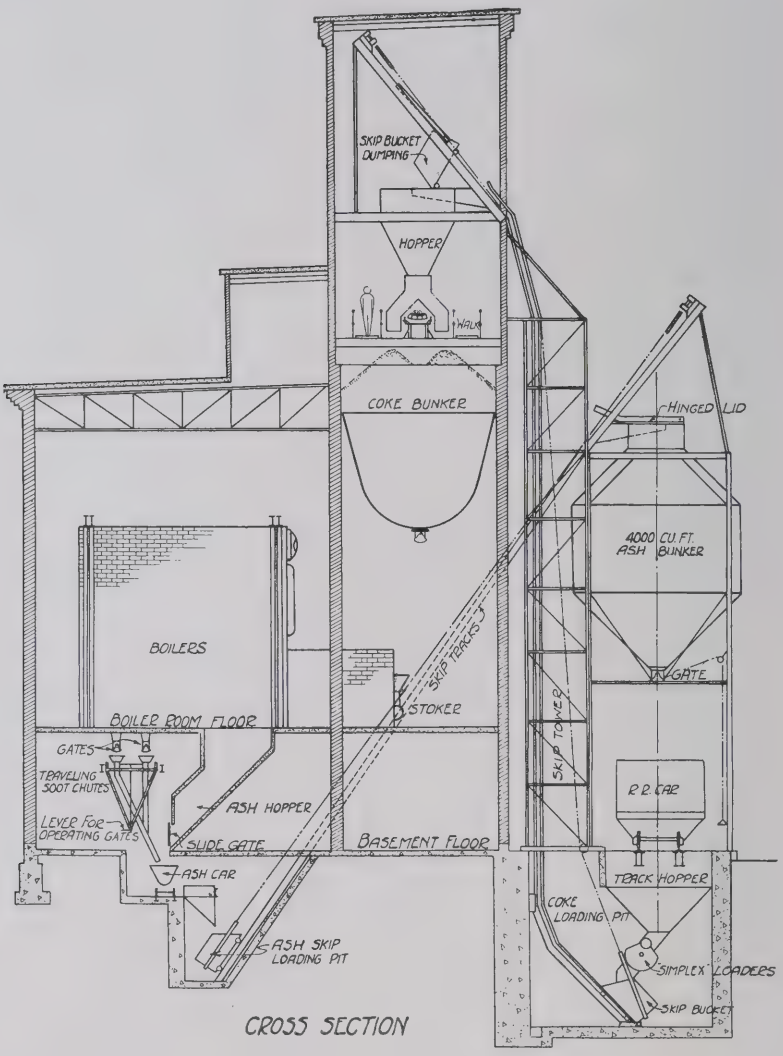
Cherry River Paper Co.
Richwood, W. Va.

Close-up View

Slow-Speed Ash Skip
and Bunker

High-Speed Coal Skip
and Bunker

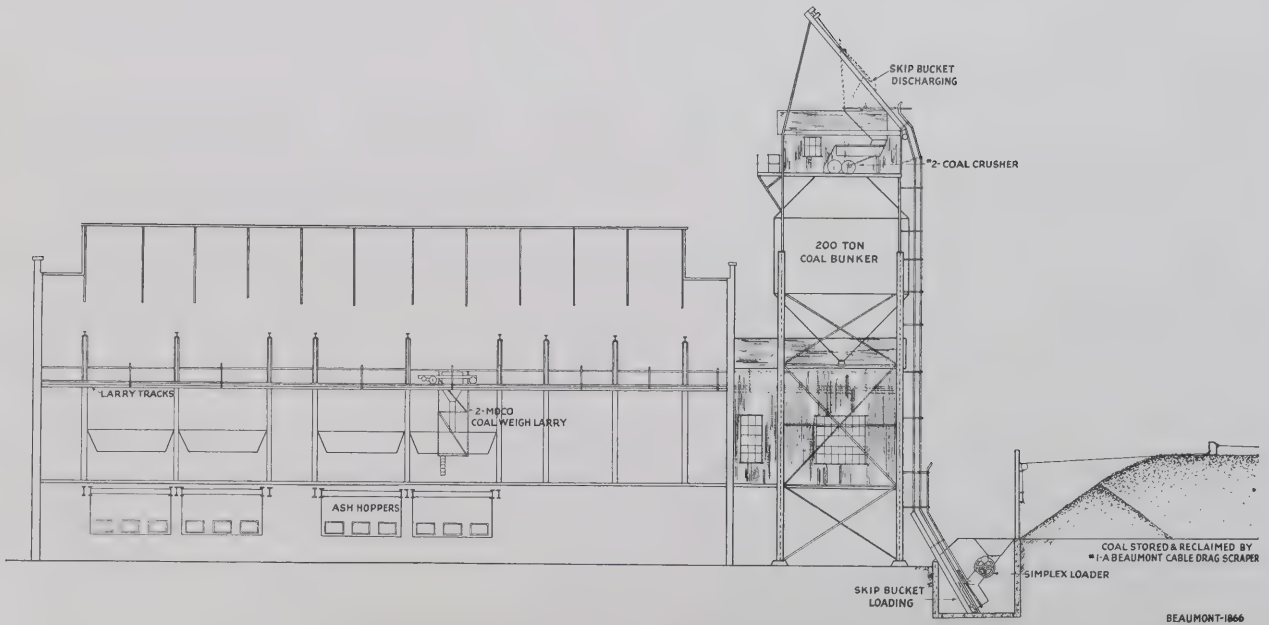




CAMBRIA STEEL CO., Johnstown, Pa.

Two high-speed balanced fuel skips and single skip for ashes, including all conveying equipment, track hoppers, loaders, structural steel, ash hoppers and gates, and ash bunker.

CAMBRIA STEEL CO., Johnstown, Pa.

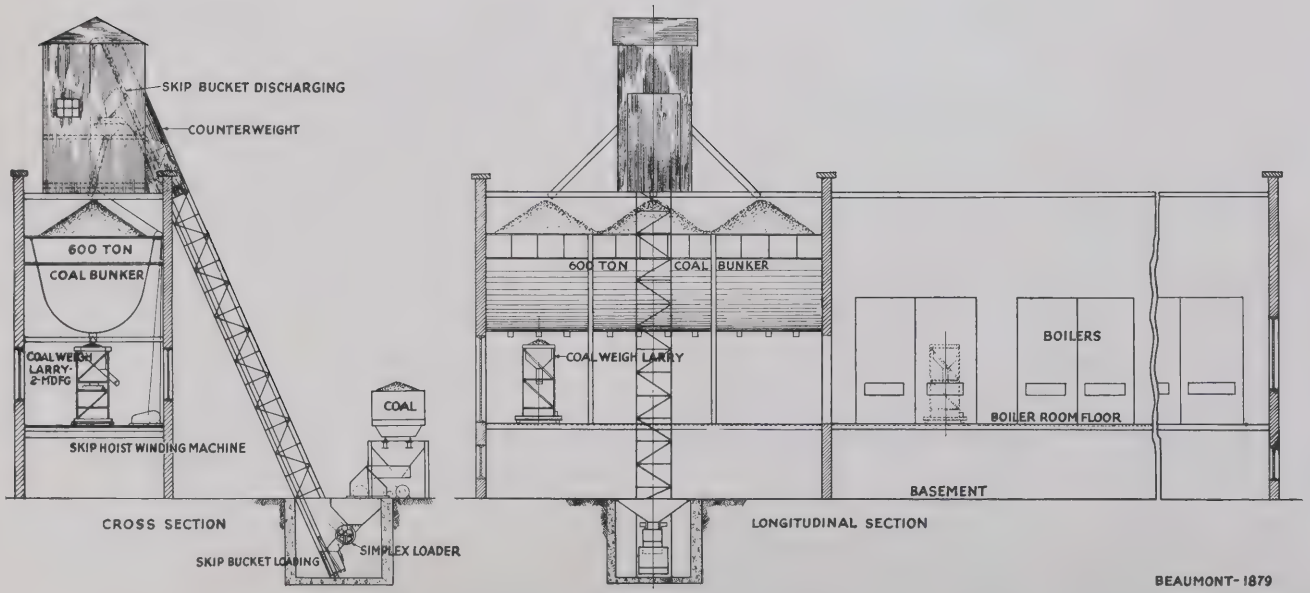


Super-Central Coal and Ash Handling System

CRANE CO., Bridgeport, Conn.

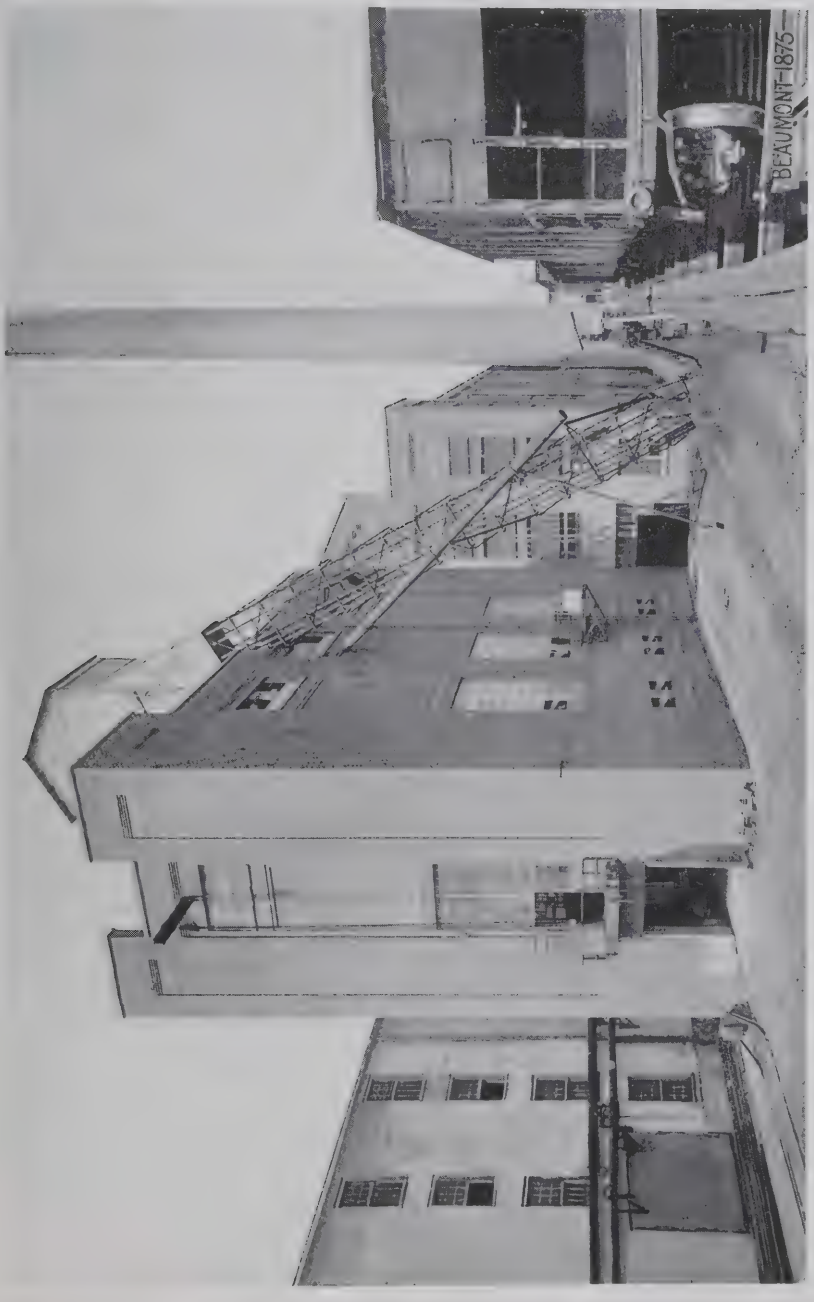
This contract included the entire coal and ash handling system, including all bunkers and steel structures. Coal is handled by a single high-speed counterweighted skip hoist to a 200-ton circular steel bunker. A 2-ton larry feeds coal to the stokers. The ground storage of coal is taken care of by a Beaumont Cable Drag Scraper.

CRANE CO., Bridgeport, Conn.

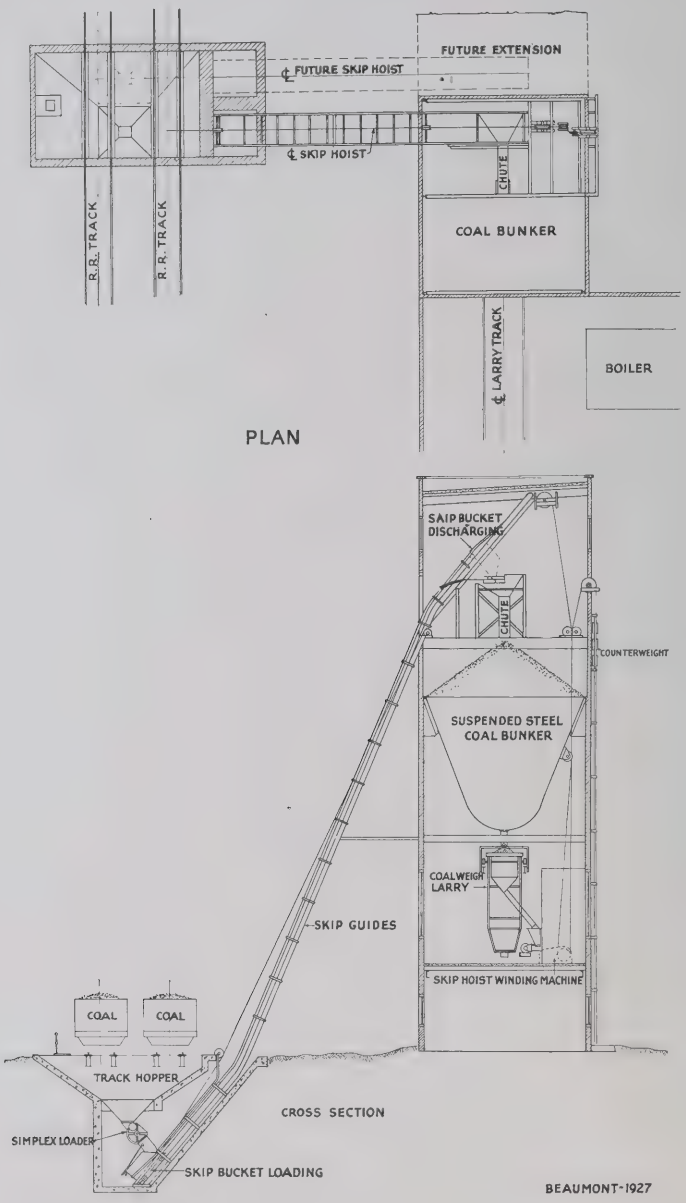


KEASBEY & MATTISON CO., Ambler, Pa.

High-speed counterweighted skip hoist for coal, suspended steel coal bunker, No. 2-MDFG coal weigh larry and complete cable drag scraper system.

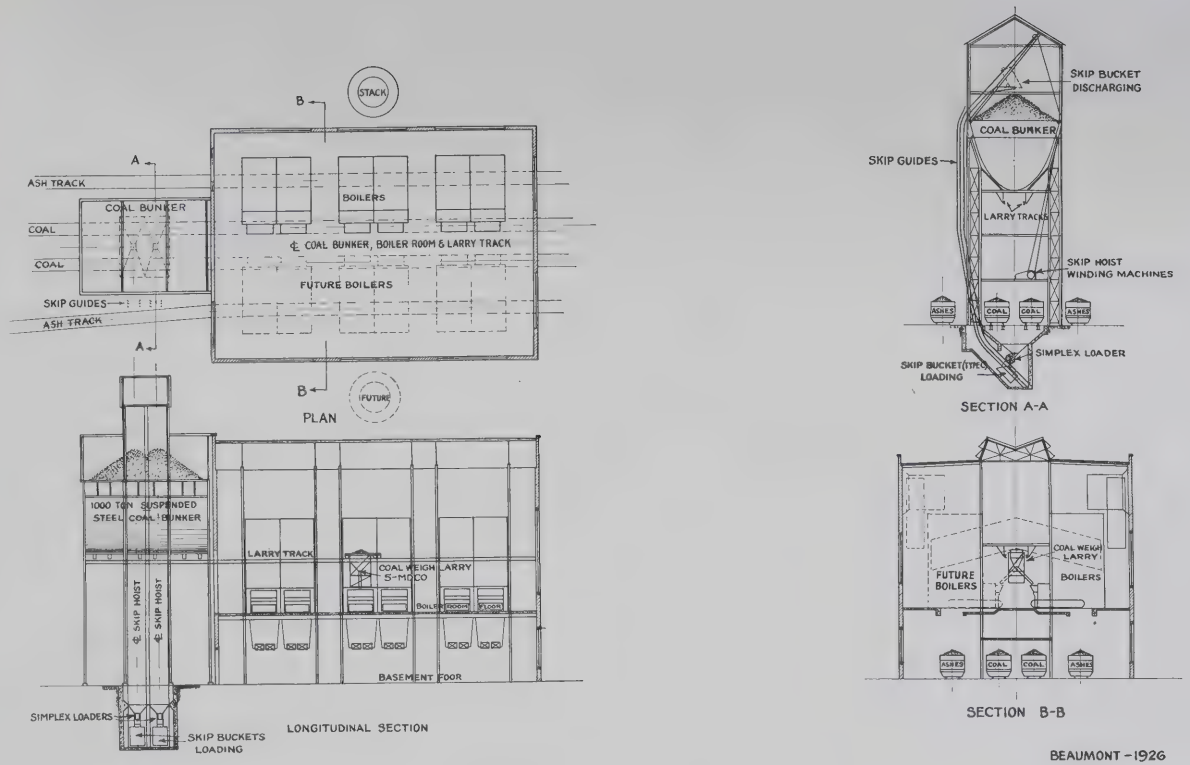


KEASBEY & MATTISON CO., Ambler, Pa.



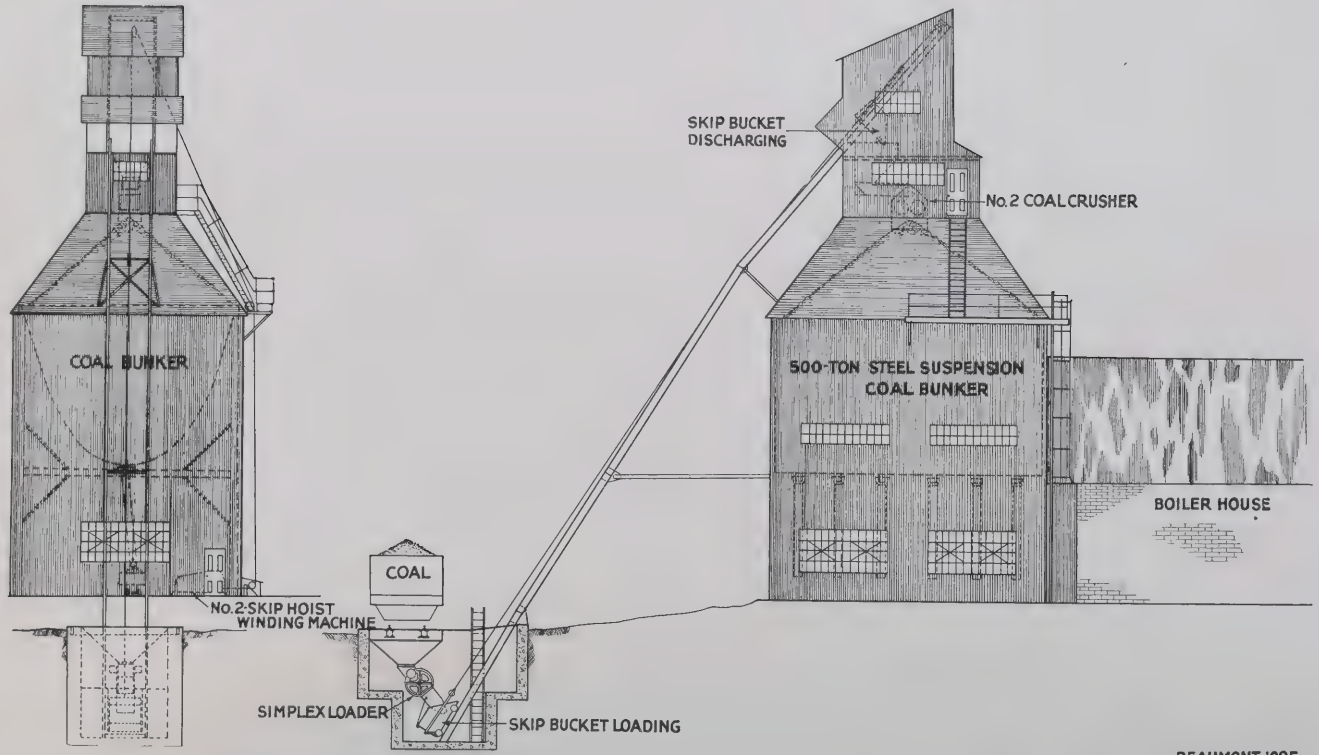
THE NORTHWEST PAPER CO., Cloquet, Minn.
Geo. F. Hardy, Engineer

High-speed counterweighted skip hoist for coal, platform operated coal weigh larry, hoppers, etc.



EAST PENN ELECTRIC CO., Pine Grove, Pa.
J. G. White Engineering Corp., Engineers

Two high-speed counterweighted skip hoists (Path "C") for coal, No. 5-MDCO coal weigh larry, hoppers, loaders, etc.

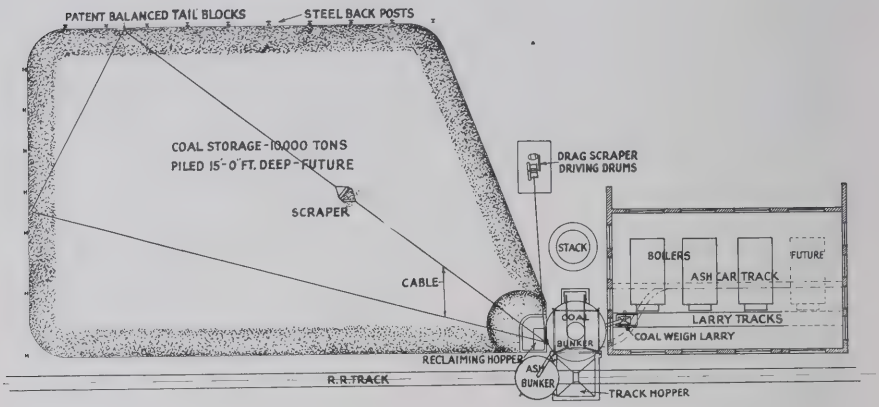


NATIONAL TRANSIT CO., East Kane, Pa.

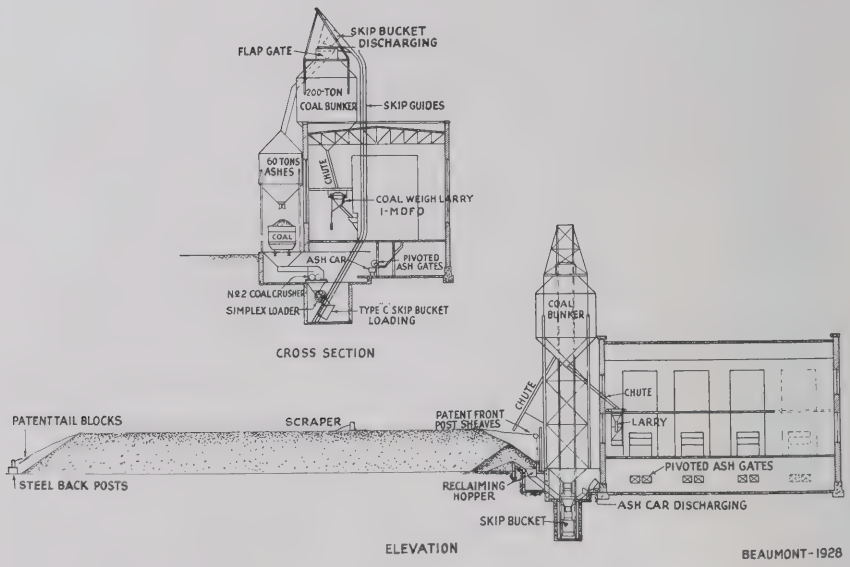
Medium speed unbalanced skip hoist for coal, steel suspended bunker, No. 2 coal crusher, chutes, hoppers, etc.

Beaumont High-Speed Counterweighted Skip Hoist

MINNEAPOLIS GAS LIGHT CO.
Minneapolis, Minn.

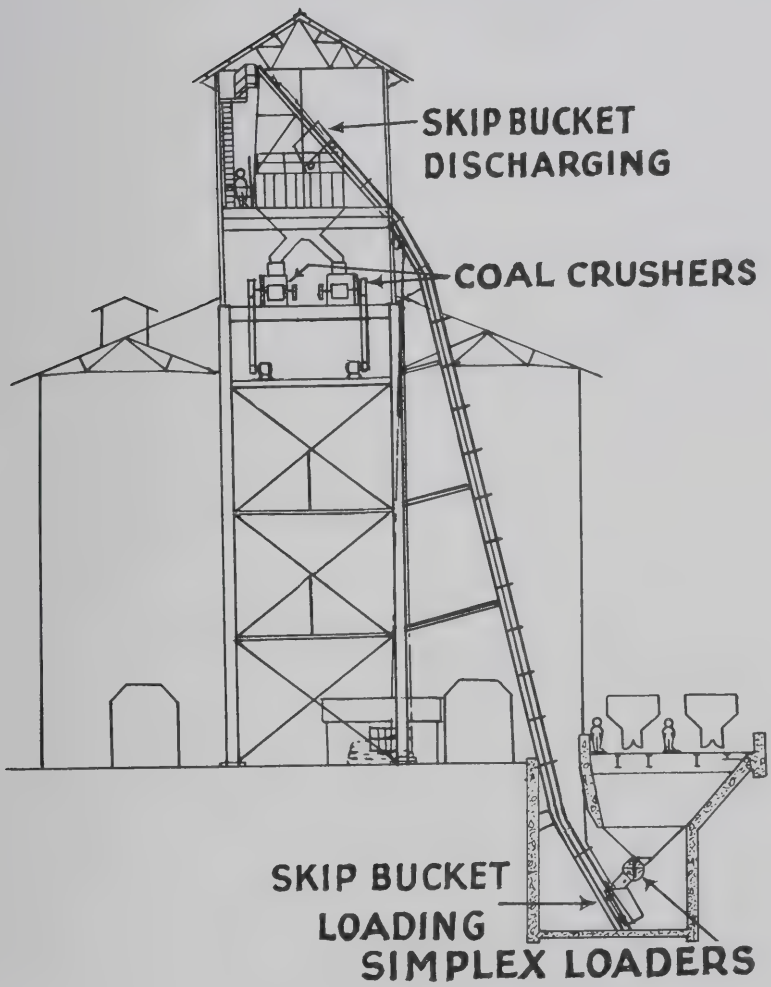


PLAN



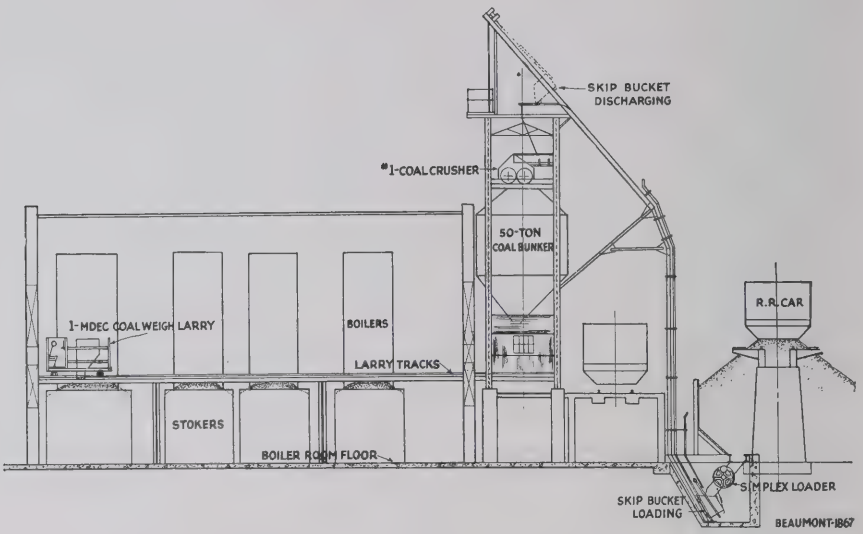
PORTSMOUTH STREET RAILROAD & LIGHT CO., Portsmouth, Ohio
F. W. C. Bailey, Engineer

Super-central coal and ash handling system, including high-speed skip hoist (Path "C") for both coal and ashes, circular steel coal bunker, No. 2 coal crusher, 2-MDFO coal weigh larry, ash hoppers and gates, etc.



TATA IRON & STEEL CO., Ltd., Jamshedpur, India
Perin & Marshall, Engineers

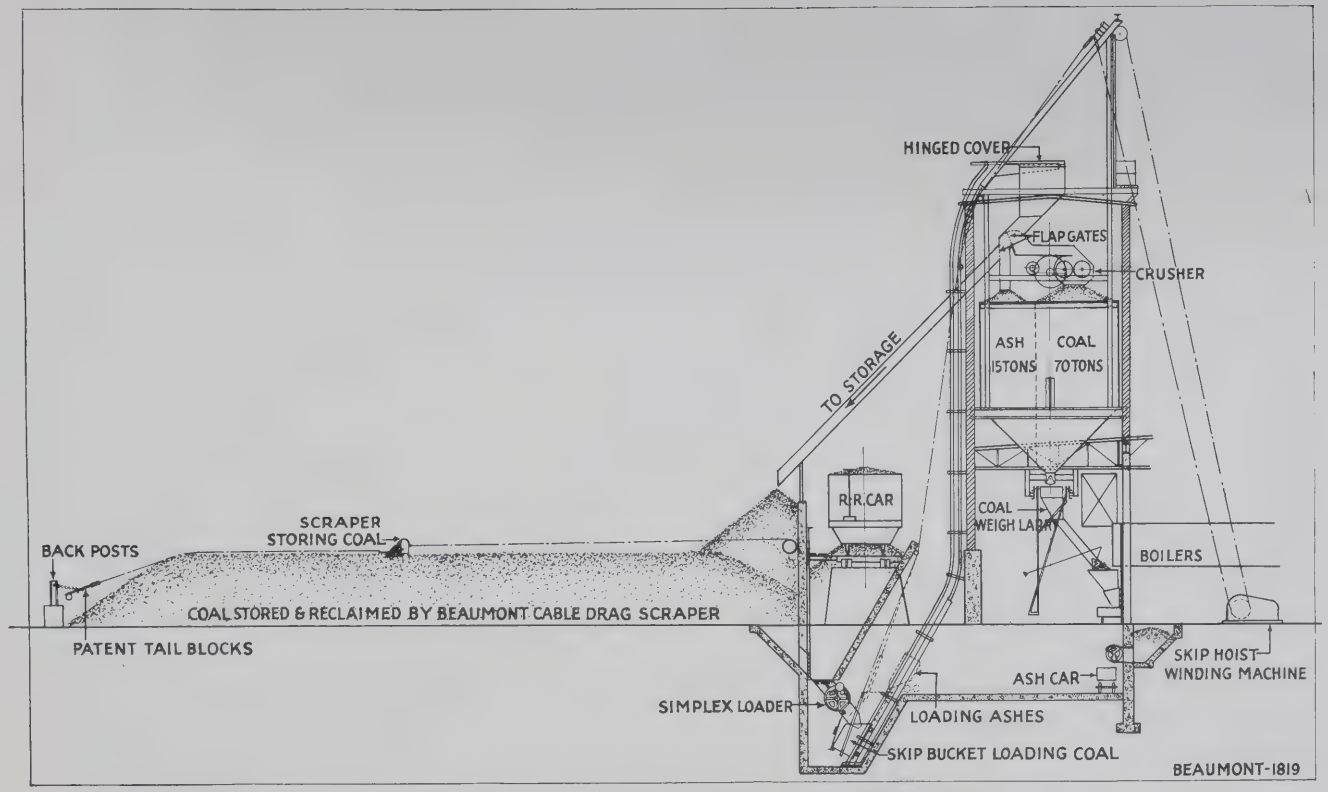
Complete balanced high-speed skip hoist for coal, No. 2 coal crushers, feeders, belt conveyor for distribution of coal, hoppers, Simplex loaders, etc.



FLINT CITY WATER WORKS, Flint Mich.

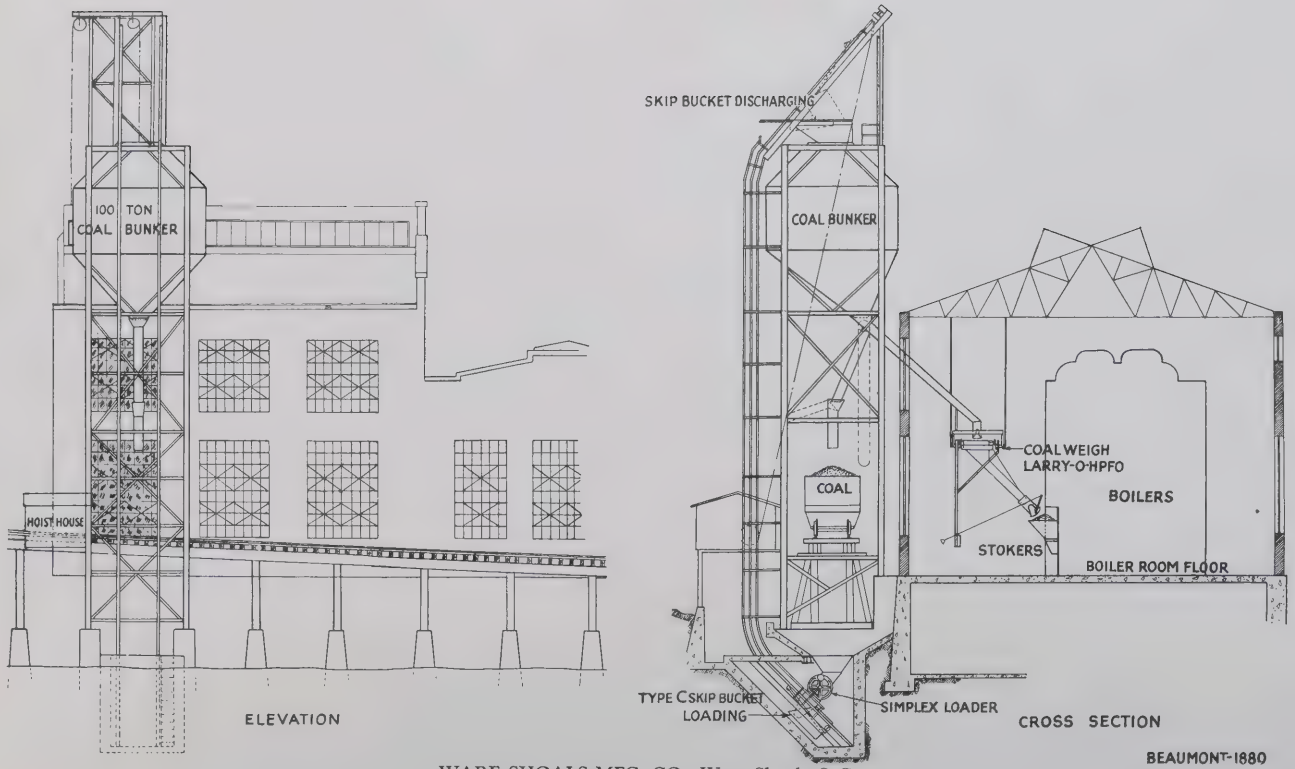
Medium speed unbalanced skip hoist for coal, No. 1-A crusher, circular steel coal bunker, No. 1-MDEC coal weigh larry, etc.

General View of Plant



FITCHBURG PAPER CO., Fitchburg, Mass. Geo. F. Hardy, Engineer

Consists of a Beaumont High-Speed Counterweighted Skip to handle both coal and ashes, a circular steel bunker, No. 1-MDFO larry to feed stokers and the Beaumont Cable Drag Scraper for ground storage.

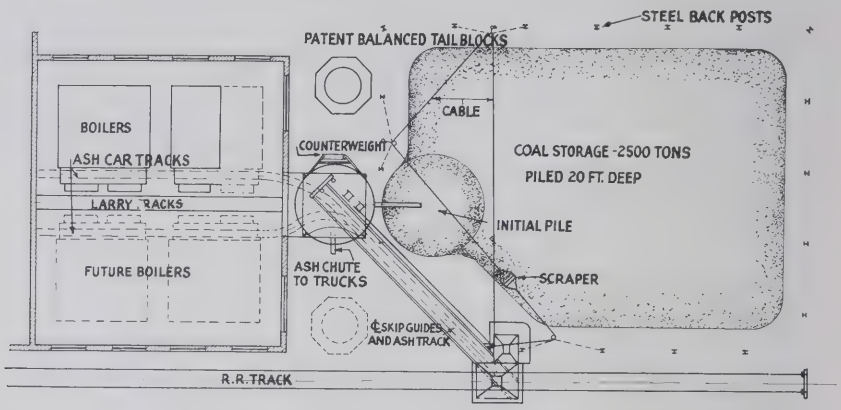


WARE SHOALS MFG. CO., Ware Shoals, S. C.
J. E. Sirrine & Co., Engineers

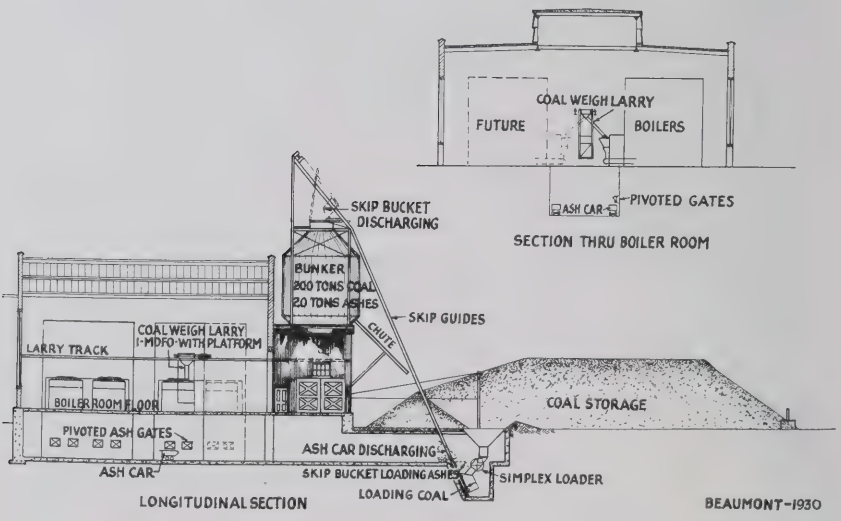
Slow-speed unbalanced skip hoist (Path "C") for coal, circular steel coal bunker, No. 0-HPFO coal weigh larry, etc.

Beaumont Medium Speed Unbalanced (Type "C") Skip Hoist

ST. LOUIS & SOUTHWESTERN RAILROAD, Locomotive Coaling Station at Plano, Texas
Duplicate installed at Camden, Ark.

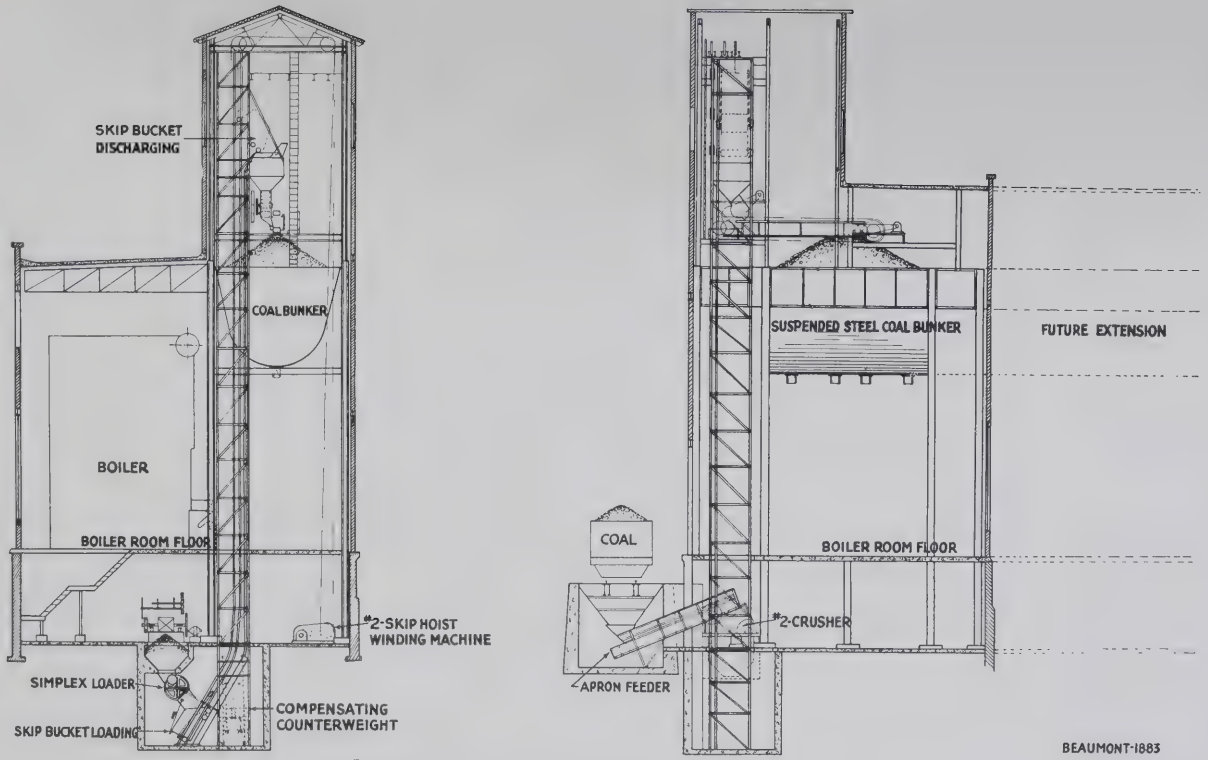


PLAN



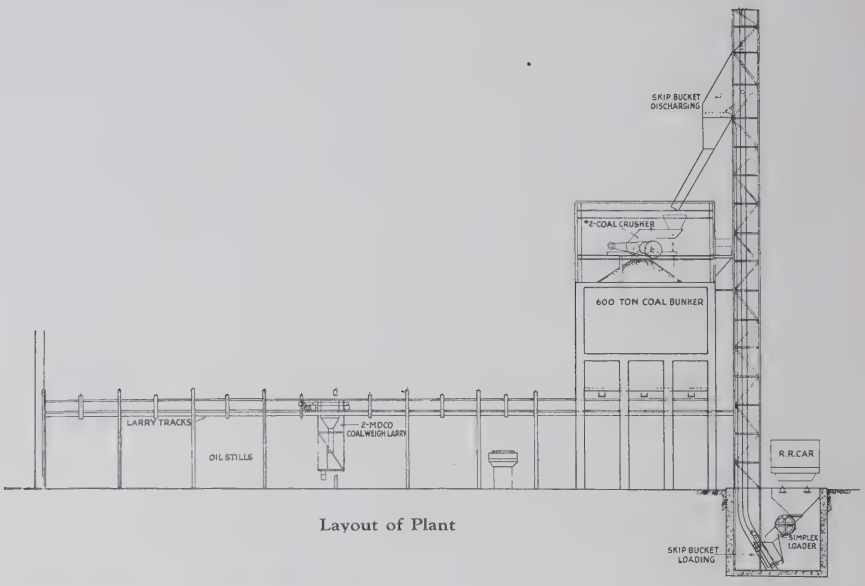
KIECKHEFER CONTAINER CO., Delair, N. J.
Emery L. Walker, Engineer

Super-central coal and ash handling system, including high-speed counterweighted skip hoist for both coal and ashes, circular steel coal and ash bunker, 1–MDFO larry with platform, ash gates, etc., complete No. 1-A cable drag scraper system.



INTERNATIONAL HARVESTER CO., Fort Wayne, Ind.
Day & Zimmermann, Engineers

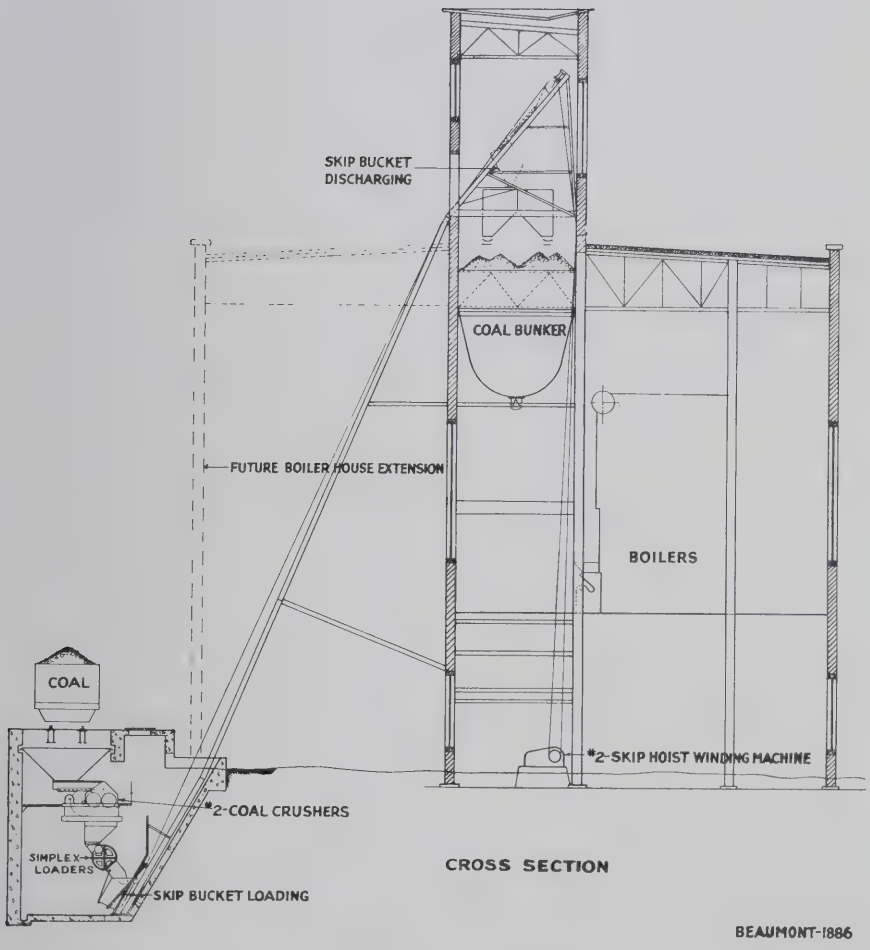
High-speed counterweighted skip hoist for coal, No. 2 crusher, apron feeder, hoppers, etc.



Layout of Plant

STANDARD OIL CO., Buffalo, N. Y. John W. Cowper Co., Engineers

High-speed counterweighted skip hoist, No. 2 coal crusher, 2–MDCO coal weigh larry, etc., at oil stills.



COUNTIES GAS & ELECTRIC CO., Bridgeport, Pa.
U. G. I. Contracting Co., Engineers

High-speed Beaumont Coal Skip Hoists, No. 2 crushers, belt conveyors, etc.

PITTSBURGH & LAKE ERIE R. R. CO., Locomotive Coaling Station, Brightwood, Pa.

Two single counterweighted skip hoists elevating 150 tons of coal per hour. Insert shows single counterweighted ash skip elevating 30 tons of ashes per hour.

The Beaumont Ash Skip Hoist

THE Skip Hoist is the best and most commonly used ash-hoisting device. In connection with a small push car or electric ash larry, to collect ashes from hoppers under the boiler, it makes an ideal ash handling unit.

This system is not affected by grit, heat or water, as only the collection car and skip bucket come in contact with the ashes, and these parts are rugged and cannot be easily injured. Higher capacities can be obtained with the skip system than with any other ash handling method.

High lift does not add stress in a skip hoist or require extra power as with other methods. The operating cost is low because only one man is required to run the skip system. Installation cost is low because of the few and simple parts.

As the skip hoist operates only while doing work the power consumption is at a minimum. On account of the few and simple parts comprising the car and skip system the danger of breakdown is almost negligible and the repair cost is very low.

The car and skip system is better adapted to handling large clinkers, soot, broken firebrick linings, etc., which all must be disposed of in the modern boiler plant. The operation of the system is noiseless, a feature which is desirable in built-up sections, as generally the bulk of ashes are handled at night, when the power requirements are less.

The Beaumont Ash Skip Hoist has been developed to a high degree of perfection. It is in use in hundreds of industrial and central station boiler houses throughout the United States and Canada. (List of installations furnished on request.)

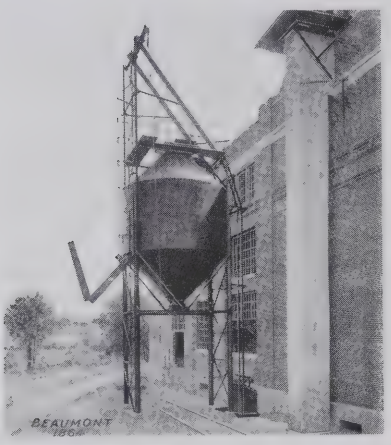
The skip guides, discharge superstructure, ash storage bunker and supports are all self-contained in a neat, workmanlike steel structure. The top of the storage bunker is covered with a steel plate cover, which is opened and closed automatically by the skip bucket when discharging into the storage bunker.

Beaumont Ash Skip Hoists are built in standard sizes shown on the following pages. Any desired handling capacity in tons per hour can be obtained.

For detail specifications of the parts comprising a Beaumont Ash Skip Hoist refer to pages 24 to 77, inclusive.

Beaumont Ash Skip and Circular Bunkers

Inclined Discharge Type—Vertical Tracks



40 cu. ft. Skip Bucket 4000 cu. ft. Bunker
PHILA. SUBURBAN GAS AND ELEC. CO.
Cromby, Pa.

20 cu. ft. Skip Bucket 2000 cu. ft. Bunker
H. W. JOHNS-MANVILLE CO.
Manville, N. J.

Inclined Discharge Type—Inclined Tracks

20 cu. ft. Skip Bucket 3000 cu. ft. Bunker
MUNICIPAL LIGHTING PLANT
Richmond, Ind.

40 cu. ft. Skip Bucket 2000 cu. ft. Bunker
ROSS PUMPING STATION
Pittsburgh, Pa.

Advantages of The Beaumont Ash Skip Hoist

1. Not Affected by Grit, Heat or Water. Ashes can be handled either wet or dry, hot or cold. The skip bucket is not materially affected by any of these conditions, as are chain joints, elbows, exhausters, etc., constituting other types of ash-handling equipment. The hoist itself, being the only part that can be injured by the ashes, is always placed in a position remote from the skip so that dust or dirt cannot reach it.

2. High Capacity. A 36-cubic foot electric ash car on 130-foot haul, traveling 400 feet per minute, can make a round trip (260 feet) in about two minutes, including filling and dumping. This equals 20 tons per hour for the extreme haul or 40 tons per hour for average haul. A balanced skip, consisting of two 100-cubic-foot buckets, one going up while the other is coming down, can handle ashes at 170 tons per hour, 75-foot lift; a single bucket skip, 60-cubic-feet capacity, would handle 30 tons per hour, at 50 cubic feet per ton, and 75-foot lift. Our 20-cubic-foot single bucket skips, on a 75-foot lift at 75 feet per minute, can handle 10 tons per hour.

3. High Lift. This is an objection in other types of machines. Chain and bucket elevators are short lived with high lift, and the steam jet system requires great power. Neither objection applies to the skip, because a steel cable can be as long as desired, and the horsepower of the motor is not affected by height of lift.

4. Low Operating Cost. This system requires only one inexperienced man, and his hourly output is high. He is necessary in any system, as the ashes must be fed or controlled by hand to any conveyor system. If the ash hoppers are properly designed and the correct gate is used, the work is very easy. The skip requires no attendant, the car operator pushing a button when the skip is full and the skip rises, dumps and returns to rest automatically in the pit.

5. Low Installation Cost. Fewer and simpler parts are used than in any other system, and these are all standard. Outside of the electric hoist, the entire equipment is structural steel and plate steel work.

6. Low Power Consumption. The skip runs only when doing work, whereas the other types of ash handling equipment run continuously, and frequently run empty or only partly loaded, and frictional losses are large. The 20-cubic-foot skip requires 7½ horsepower motor, when handling 10 tons per hour. Power consumption when hoisting loaded bucket is 7½ horsepower and when lowering empty bucket is zero, making an average power consumption less than 4 horsepower.

7. Freedom from Breakdown. There is no more complication in the mechanical parts of this device than there is in a plain freight elevator, the reliability of which is well known. The moving parts consist only of a bucket, a winding machine and a cable.

8. Low Repair Cost. As mentioned before, the only parts touched by ashes are the skip bucket and the push car. These are very little affected, and can be renewed at small cost. Renewals and repairs other than these are minor ones that can be made at the plant without carrying a stock of expensive wearing backs, elbows, chains, sprockets or other parts.

9. Will Handle Large Clinkers, Soot, etc. Modern practice is to use forced draft stokers with high overloads, which produce large clinkers. The skip hoist is the only machine which will handle them. Soot and flue dust which clog up and choke in steam-jet systems can, of course, be easily handled by the skip hoist.

10. Operates with Minimum Noise. Some systems are extremely noisy, and are especially undesirable in built-up districts. The skip hoist is as quiet as a freight elevator.

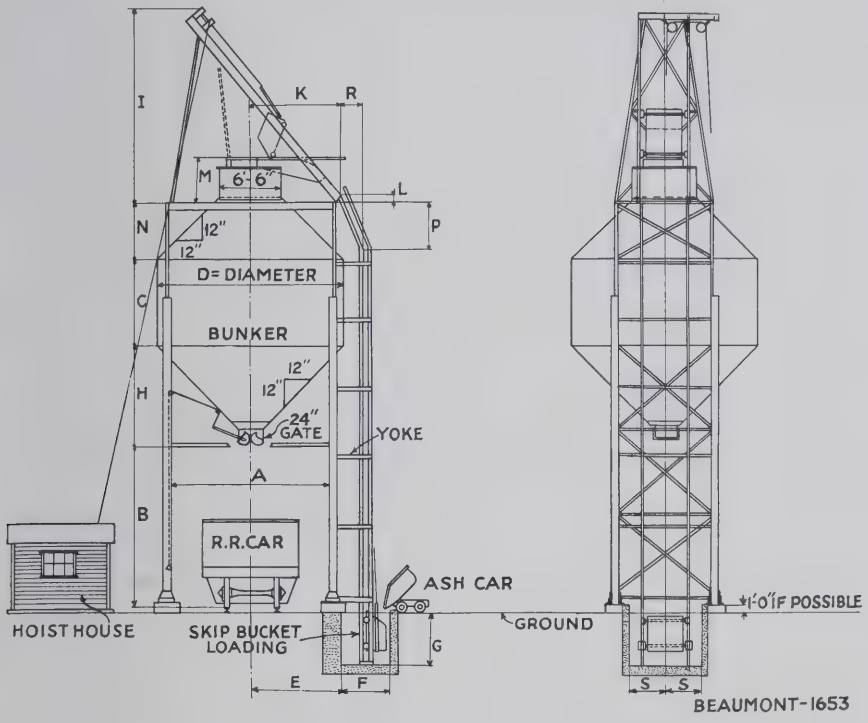
11. Meets Demands of Operation, Maintenance, Interest and Adaptability. Operation, Maintenance, Interest, Adaptability. These four are the factors which will determine the choice of any labor-saving device.

Operating cost is low because only one man is required, and he is necessary in any system (*some require more*). Power consumption is especially low.

Maintenance is low because wearing parts are few and rugged.

Interest charge is low because first cost is low.

Adaptability is gained because ash car and track under boilers can lead in any direction and skip can be placed where desired. This is not true of a bucket conveyor system.

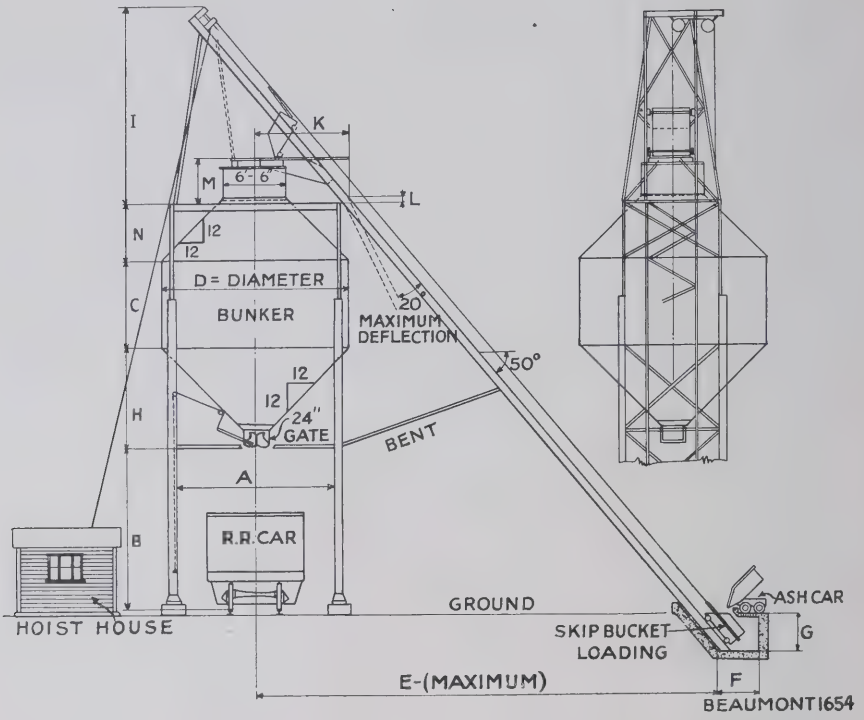


Beaumont Ash Skip and Circular Bunker

Inclined Discharge Type, Vertical Track

	14'0" Diam. 1000 cubic feet		14'0" Diam. 1500 cubic feet		14'0" Diam. 2000 cubic feet		14'0" Diam. 2500 cubic feet		16'0" Diam. 3000 cubic feet		16'0" Diam. 4000 cubic feet		19'0" Diam. 3000 cubic feet		19'0" Diam. 4000 cubic feet	
	W	R	W	R	W	R	W	R	W	R	W	R	R	R	R	R
A . .	13' 0"	13' 0"	13' 0"	13' 0"	13' 0"	13' 0"	13' 0"	13' 0"	13' 0"	13' 0"	13' 0"	13' 0"	16' 0"	16' 0"	16' 0"	16' 0"
B . .	9' 0"	16' 0"	9' 0"	16' 0"	9' 0"	16' 0"	9' 0"	16' 0"	9' 0"	16' 0"	9' 0"	16' 0"	16' 0"	22' 0"	16' 0"	22' 0"
C . .	3' 0"	3' 0"	6' 3"	6' 3"	9' 6"	9' 6"	12' 9"	12' 9"	10' 9"	10' 9"	15' 9"	15' 9"	5' 3"	5' 3"	8' 9"	8' 9"
D . .	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	16' 0"	16' 0"	16' 0"	16' 0"	19' 0"	19' 0"	19' 0"	19' 0"
E . .	8' 9"	8' 9"	8' 9"	8' 9"	8' 9"	8' 9"	8' 9"	8' 9"	8' 3"	8' 3"	8' 3"	8' 3"	10' 0"	10' 0"	10' 0"	10' 0"
F . .	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"	3' 8"
G . .	4'10"	4'10"	4'10"	4'10"	4'10"	4'10"	4'10"	4'10"	4'10"	4'10"	4'10"	4'10"	4'10"	4'10"	4'10"	4'10"
H . .	7'11"	7'11"	7'11"	7'11"	7'11"	7'11"	7'11"	7'11"	9' 0"	9' 0"	9' 0"	9' 0"	10' 6"	10' 6"	10' 6"	10' 6"
I . .	16' 0"	16' 0"	16' 0"	16' 0"	16' 0"	16' 0"	16' 0"	16' 0"	20' 0"	20' 0"	20' 0"	20' 0"	20' 0"	20' 0"	20' 0"	20' 0"
K . .	6' 3"	6' 3"	6' 3"	6' 3"	6' 3"	6' 3"	6' 3"	6' 3"	8' 0"	8' 0"	8' 0"	8' 0"	9' 3"	9' 3"	9' 3"	9' 3"
L . .	0' 4"	0' 4"	0' 4"	0' 4"	0' 4"	0' 4"	0' 4"	0' 4"	0' 7"	0' 7"	0' 7"	0' 7"	0' 7"	0' 7"	0' 7"	0' 7"
M . .	1'10"	1'10"	1'10"	1'10"	1'10"	1'10"	1'10"	1'10"	2'11"	2'11"	2'11"	2'11"	4' 2"	4' 2"	4' 2"	4' 2"
N . .	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	5' 0"	5' 0"	5' 0"	5' 0"	5' 8"	5' 8"	5' 8"	5' 8"
P . .	5' 6"	5' 6"	5' 6"	5' 6"	5' 6"	5' 6"	5' 6"	5' 6"	3' 6"	3' 6"	3' 6"	3' 6"	6' 0"	6' 0"	6' 0"	6' 0"
R . .	2' 6"	2' 6"	2' 6"	2' 6"	2' 6"	2' 6"	2' 6"	2' 6"	1' 3"	1' 3"	1' 3"	1' 3"	1' 9"	1' 9"	1' 9"	1' 9"
S . .	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"	3' 9"

W = Wagon Clearance. R = Railroad Clearance.
Dimensions are nominal and to be used only for preliminary design.
Table is for Skips using 20 cubic foot buckets. When a 40 cubic foot bucket is used E may be increased about 1 foot 0 inches, F becomes 5 feet 0 inches, G becomes 6 feet 0 inches and M becomes 3 feet 6 inches only in the case of a 19 foot 0 inch diameter Bunker.

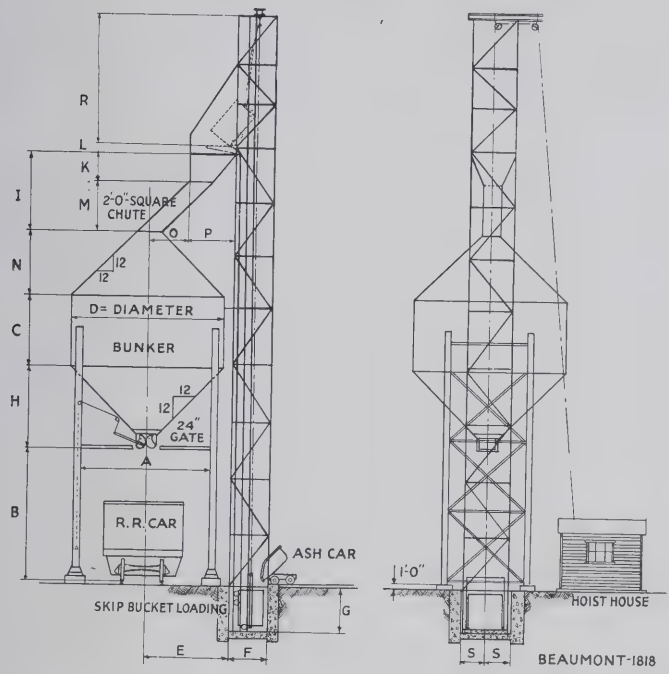


Beaumont Ash Skip and Circular Bunker

Inclined Discharge Type, Inclined Track

	14′ 0″ Diam. 1000 cubic feet		14′ 0″ Diam. 1500 cubic feet		14′ 0″ Diam. 2000 cubic feet		14′ 0″ Diam. 2500 cubic feet		16′ 0″ Diam. 3000 cubic feet		16′ 0″ Diam. 4000 cubic feet		19′ 0″ Diam. 3000 cubic feet		19′ 0″ Diam. 4000 cubic feet	
	W	R	W	R	W	R	W	R	W	R	W	R	R	R	R	R
A . .	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	16′ 0″	16′ 0″	16′ 0″	16′ 0″
B . .	9′ 0″	16′ 0″	9′ 0″	16′ 0″	9′ 0″	16′ 0″	9′ 0″	16′ 0″	9′ 0″	16′ 0″	9′ 0″	16′ 0″	16′ 0″	22′ 0″	16′ 0″	22′ 0″
C . .	3′ 0″	3′ 0″	6′ 3″	6′ 3″	9′ 6″	9′ 6″	12′ 9″	12′ 9″	10′ 9″	10′ 9″	15′ 9″	15′ 9″	5′ 3″	5′ 3″	8′ 9″	8′ 9″
D . .	14′ 0″	14′ 0″	14′ 0″	14′ 0″	14′ 0″	14′ 0″	14′ 0″	14′ 0″	16′ 0″	16′ 0″	16′ 0″	16′ 0″	19′ 0″	19′ 0″	19′ 0″	19′ 0″
E . .	29′ 8″	35′ 5″	32′ 5″	38′ 2″	35′ 2″	40′ 11″	37′ 11″	43′ 8″	39′ 9″	46′ 0″	43′ 11″	50′ 2″	48′ 2″	53′ 3″	45′ 3″	50′ 4″
F . .	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″	4′ 0″
G . .	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″
H . .	7′11″	7′11″	7′11″	7′11″	7′11″	7′11″	7′11″	7′11″	9′ 0″	9′ 0″	9′ 0″	9′ 0″	10′ 6″	10′ 6″	10′ 6″	10′ 6″
I . .	16′ 0″	16′ 0″	16′ 0″	16′ 0″	16′ 0″	16′ 0″	16′ 0″	16′ 0″	20′ 0″	20′ 0″	20′ 0″	20′ 0″	20′ 0″	20′ 0″	20′ 0″	20′ 0″
K . .	6′ 3″	6′ 3″	6′ 3″	6′ 3″	6′ 3″	6′ 3″	6′ 3″	6′ 3″	8′ 0″	8′ 0″	8′ 0″	8′ 0″	9′ 3″	9′ 3″	9′ 3″	9′ 3″
L . .	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″	0′ 7″
M . .	1′10″	1′10″	1′10″	1′10″	1′10″	1′10″	1′10″	1′10″	2′11″	2′11″	2′11″	2′11″	4′ 2″	4′ 2″	4′ 2″	4′ 2″
N . .	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 8″	5′ 8″	5′ 8″	5′ 8″

W = Wagon Clearance. R = Railroad Clearance.
Dimensions are nominal and to be used only for preliminary design.
Table is for skip hoists using 20 cubic foot buckets. When a 40 cubic foot bucket is used F becomes 5 feet 0 inches, G becomes 6 feet 0 inches and M becomes 3 feet 6 inches only in the case of a 19 foot 0 inch diameter Bunker. E can vary anywhere between a vertical skip and maximum given.



Beaumont Ash Skip and Circular Bunkers

Vertical Tower Type

	14-ft. Diam. 1000 Cu. Ft.		14-ft. Diam. 1500 Cu. Ft.		14-ft. Diam. 2000 Cu. Ft.		14-ft. Diam. 2500 Cu. Ft.		16-ft. Diam. 3000 Cu. Ft.		16-ft. Diam. 4000 Cu. Ft.		19-ft. Diam. 3000 Cu. Ft.		14-ft. Diam. 4000 Cu. Ft.	
	W	R	W	R	W	R	W	R	W	R	W	R	R	R	R	R
A . .	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	13′ 0″	16′ 0″	16′ 0″	16′ 0″	16′ 0″
B . .	9′ 0″	16′ 0″	9′ 0″	16′ 0″	9′ 0″	16′ 0″	9′ 0″	16′ 0″	9′ 0″	16′ 0″	9′ 0″	16′ 0″	16′ 0″	22′ 0″	16′ 0″	22′ 0″
C . .	3′ 0″	3′ 0″	6′ 3″	6′ 3″	9′ 6″	9′ 6″	12′ 9″	12′ 9″	10′ 9″	10′ 9″	15′ 9″	15′ 9″	5′ 3″	5′ 3″	8′ 9″	8′ 9″
D . .	14′ 0″	14′ 0″	14′ 0″	14′ 0″	14′ 0″	14′ 0″	14′ 0″	14′ 0″	16′ 0″	16′ 0″	16′ 0″	16′ 0″	19′ 0″	19′ 0″	19′ 0″	19′ 0″
E . .	7′ 6″	7′ 6″	7′ 6″	7′ 6″	7′ 6″	7′ 6″	7′ 6″	7′ 6″	8′ 6″	8′ 6″	8′ 6″	8′ 7″	10′ 0″	10′ 0″	10′ 0″	10′ 0″
F . .	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″	3′ 8″
G . .	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″	4′ 10″
H . .	7′ 11″	7′ 11″	7′ 11″	7′ 11″	7′ 11″	7′ 11″	7′ 11″	7′ 11″	9′ 0″	9′ 0″	9′ 0″	9′ 0″	10′ 6″	10′ 6″	10′ 6″	10′ 6″
I . .	7′ 11″	7′ 11″	7′ 11″	7′ 11″	7′ 11″	7′ 11″	7′ 11″	7′ 11″	8′ 11″	8′ 11″	8′ 11″	8′ 11″	10′ 5″	10′ 5″	10′ 5″	10′ 5″
K . .	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″	1′ 8″
L . .	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″	1′ 0″
M . .	6′ 3″	6′ 3″	6′ 3″	6′ 3″	6′ 3″	6′ 3″	6′ 3″	6′ 3″	7′ 3″	7′ 3″	7′ 3″	7′ 3″	8′ 9″	8′ 9″	8′ 9″	8′ 9″
N . .	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	5′ 0″	6′ 0″	6′ 0″	6′ 0″	6′ 0″	7′ 6″	7′ 6″	7′ 6″	7′ 6″
O . .	4′ 3″	4′ 3″	4′ 3″	4′ 3″	4′ 3″	4′ 3″	4′ 3″	4′ 3″	5′ 3″	5′ 3″	5′ 3″	5′ 3″	6′ 9″	6′ 9″	6′ 9″	6′ 9″
P . .	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″	3′ 3″
R . .	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″	16′ 7″
S . .	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″	3′ 9″

Advantages of an Ash Storage Bunker

A FEW modern boiler plants have been designed where the ashes drop direct from the hoppers under the boilers into railroad cars. We strongly advocate the use of an ash storage bunker outside the boiler house and over the railroad track. The railroads cannot be depended upon to place cars under the boilers with sufficient regularity to allow the omission of the ash storage bunker.

They do not want their cars delayed by using them for storage purposes and they do not always have suitable cars available for this purpose. It is not wise to be so entirely dependent on railroad cars for the disposal of ashes. Again, railroad cars under the boilers need a very high basement, therefore adding greatly to the expense of the building. Railroad tracks running under the boiler house interfere with the outdoor ground storage area, which should always be alongside of the boiler house. They also interfere with possible future extension.

It is almost a law of nature that a reservoir should be provided in all systems. This applies to not only coal and ashes but to grain, merchandise and everything which is used. Nothing can be consumed at the same rate it is produced—a balancing reservoir is always necessary.

The use of railroad cars under boilers for disposing of ashes has the following disadvantages:

1. The curved railroad tracks outside of a boiler house occupy valuable space and are frequently in the way of buildings, etc.

2. The boilers must be set very high in order to get sufficient capacity in the ash hoppers and to clear the railroad cars.

3. The ash hoppers must be unduly large in order to hold enough ashes to load up the railroad cars.

4. The railroad cars are not always available.

5. It is difficult to shift these railroad cars back and forth under the boiler room. There is not sufficient head room for a locomotive to shift them.

6. The cost of the high boiler room floor and the large ash hoppers plus winding machine for railroad cars and the cost of the track construction, turn-outs, switches, etc., is more than sufficient to cover the cost of a Beaumont Standard Car and Skip System.

7. It is unwise to have no storage between boilers and railroad, because this ties up the operation of the boiler house directly to railroad service without a reservoir to balance operations between the boiler room management and the railroad management.

8. It is very unwise to assume that ashes can always be disposed of by railroad. In winter time, wet ashes freeze in railroad cars. Railroads must be paid to remove these ashes. Strikes or car shortage may make it difficult to obtain cars or difficult to dispose of the cars.

9. In all questions of handling coal, ashes, water or any supplies, whether incoming or outgoing, not only in boiler houses but in a factory, there must be a "reservoir" with which to balance the irregularity between input and output. This balancing unit in an ash handling system is the external bunker.

10. It is not possible to predetermine how ashes must be disposed of throughout the future years. Circumstances frequently necessitate their disposal by trucks, not only because the ashes freeze in cars, or the railroads charge too much, or the cars are not available, but because ashes can frequently be sold to contractors or can be dumped locally much more readily by trucks than by railroad cars. It is extremely unwise to provide only one source of removal and just as unwise not to provide ample storage capacity of ashes, which should be at least sixteen hours' run.

11. With an external ash bunker the duty of the boiler house management is merely to place the ashes in this bunker. The problem of removing them by rail or trucks from this bunker, or even spouting them onto the ground in an emergency, is up to the yard management and cannot interfere at all with the boiler room operation.

12. Railroad companies themselves advise us that even though they are in the business they cannot get cars whenever they want them to dispose of ashes, and consequently have to have several days' storage overhead.

Beaumont Ash Larry and Trailer

Specifications

CAPACITY 50 cubic feet.

BODY 3/16-inch steel plate, stiffened with angles. Minimum valley slope 45 degrees. All rivets flat head inside. Opening in bottom 24 inches by 36 inches and fitted with pivoted gate, which is opened and closed automatically by dumping cams at discharge point.

FRAME AND CAGE are of structural steel and well braced. The cage is designed so that the operator can see fore and aft and also into the ash car. Floor is of steel plate. Sheet steel sides are provided when used for outdoor service. Sheet steel guard is provided to keep ashes out of cage.

WHEELS are 16 inches diameter, single flanged, cast iron with chilled treads keyed to through axles, one axle being geared to the driving countershaft. Journal boxes are set in spring bearings.

MOTOR. Totally enclosed—15 H.P. Westinghouse (or equal) Type C. I. for A. C. and Type K for D. C. Motor is spring suspended from frame. We recommend low voltages, 110 or 220 volts, on account of danger from higher voltages on exposed conductor rails.

CONTROLLER. Drum type enclosed in a steel case. Controller has a sufficient number of steps to insure smooth operation. Located at operator's left hand.

GEARING. Double reduction, cast steel, spur gear drive. Axle gear is split to facilitate removal.

GEAR CASE. Gears run in oil in dust-proof gear case.

COLLECTORS are of the cast iron slide type, mounted on fibre insulators.

CONDUCTOR RAILS are 2-inch by 2-inch by 3/16-inch steel angles mounted on standard mine type insulators and supported from basement ceiling.

BRAKE SHOES are cast iron arranged to easily facilitate adjustment and replacement. Brakes are controlled by a hand lever in the cage at right hand of operator.

BUMPERS. Heavy cast iron.

SIGNAL. Mechanical foot gong.

PERFORMANCE. Ash larry is designed with ample strength to pull two loaded trailers. Speed, 300 feet per minute.

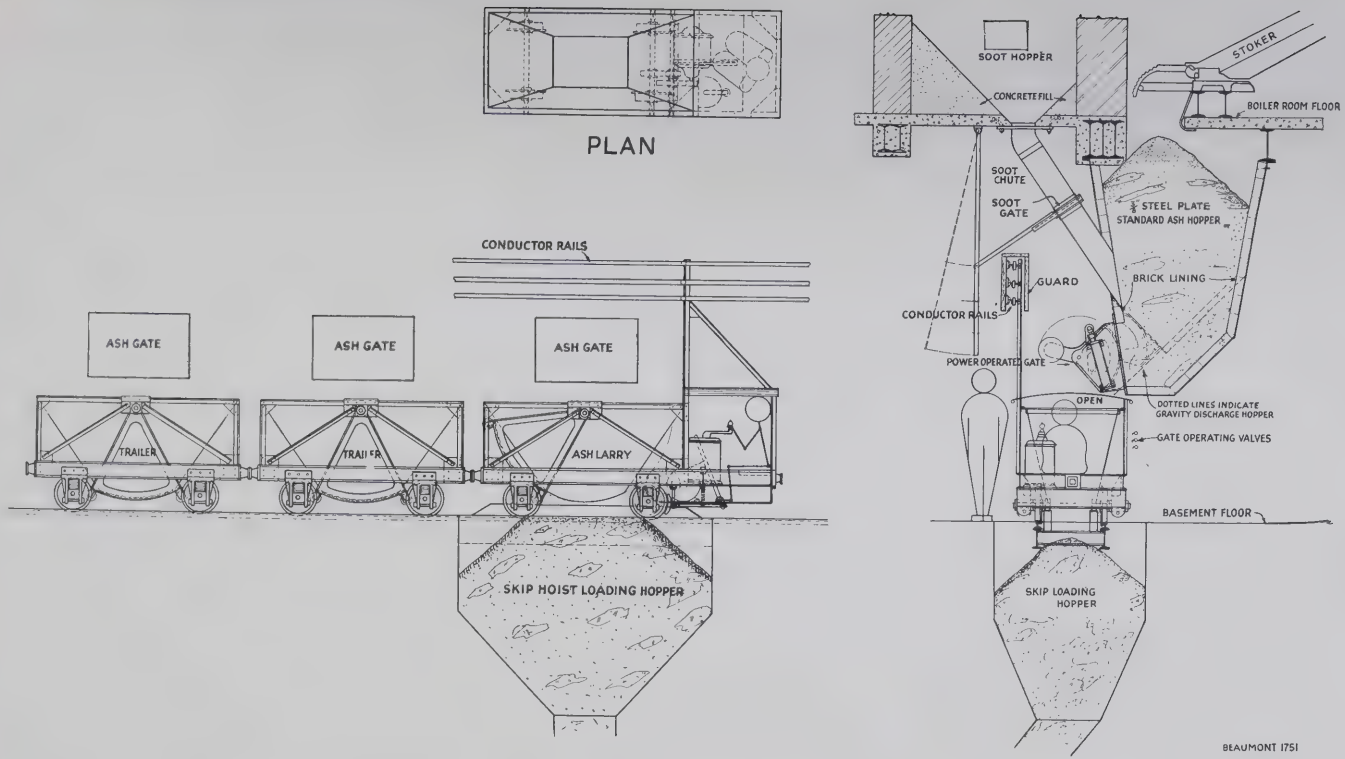
TRAILERS are identical with ash larry except that driving mechanism and cage are omitted.

TRACKS are 35 pounds per yard tee rails mounted on steel ties.

DUMPING CAMS are cast iron of such shape to discharge cars with minimum shock.

TRACK BEAMS over skip loading hopper are 8-inch 18.4-pound I-beams fitted with end-bearing plates and channel spacers to hold them to gauge.

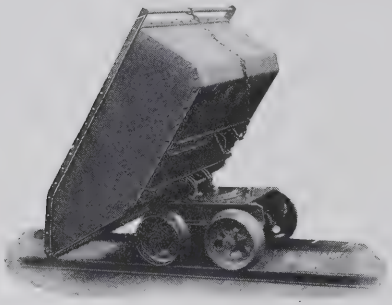
SKIP HOIST LOADING HOPPER will be 6 feet by 10 feet in plan. Hopper is built of 1/4-inch steel plate stiffened with angles. Flat head rivets are used inside the hopper. It is suspended from track beams by substantial bolts and cast washers. Minimum valley slope of hopper is 45 degrees to insure self cleaning. Bottom of hopper is arranged to receive Simplex Automatic Skip Bucket Loader. Capacity of hopper is 150 cubic feet.



Beaumont Ash Larry with Trailers for High Capacities

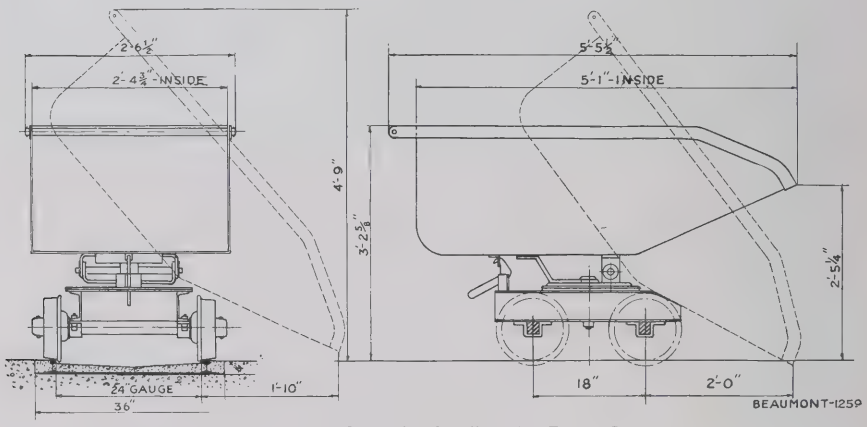
Motor operated with Conductor Rails or Storage Batteries

Beaumont Rotating Dump Car



Beaumont Rotating Dump Car for Ashes

THIS is our standard car which we have adopted to use for moderate capacities in connection with our skip hoist. We have learned from experience that a man will handle more ashes in a day with a car of this size than with a larger one. The pressure necessary to move this car along the track when fully loaded is about twenty-five pounds. If a larger car is used, it is harder to push and the man moves slowly and rests oftener, and does not accomplish as much.



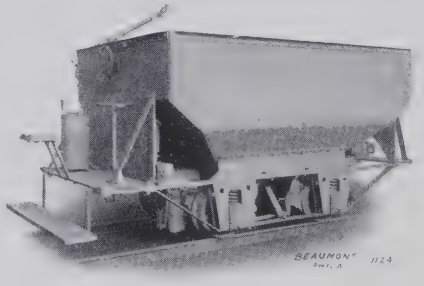
Dimensions of 18-cubic-foot Rotating Dump Car

Specifications

Ash car will be of the rotary scoop type, having a water capacity of 18 cubic feet. Body will be constructed of ⅛-inch steel plate mounted on a structural steel frame having single flanged, roller bearing, cast steel wheels. Substantial steel latch keeps car body in position when upright. A chain is provided to release latch in discharging or swivelling car. Car will operate on a 24-inch gauge track.

Bottom Discharge Electric Car

For Coal or Ashes

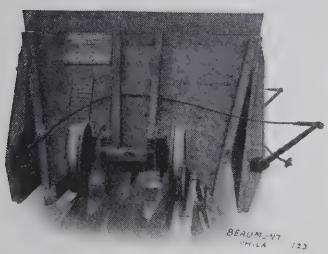


FOR large capacity plants and for curved paths the electric car shown is recommended. It is rugged, simple and dependable and may be easily expanded by the addition of trailers.

Used when discharging through the tracks. Built for third rail, overhead wire or storage battery current.

Both Side Discharge Electric Car

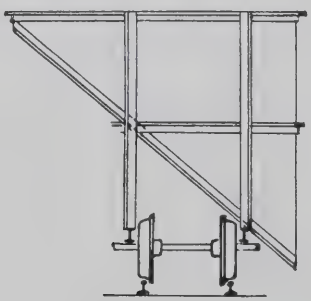
For Coal or Ashes



Has the advantages of the car described above. Used when desirable to discharge clear of tracks on both sides.

One Side Discharge Electrical Car

For Coal or Ashes



Used when desirable to discharge to one side only.

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Section 2—THE LARRY

Index

THE BEAUMONT COAL WEIGH LARRY FOR BOILERS

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BUNKER GATES

Hand Operated 140
Motor Operated 141

The Beaumont Coal Weigh Larry for Boilers

BEAUMONT Coal Weigh Larries are in use in hundreds of central station and industrial plant boiler houses. Fundamentally, a larry is a plate steel hopper suspended on scale irons, the whole being mounted on a truck which runs on tracks, immediately beneath the coal bunker and for the full length of the boiler room.

The coal is drawn into the larry and weighed, then discharged to the stokers as needed. It is advisable to enlarge the stoker magazines to enable the larry operator to feed five or six hours' run to each boiler at one time, leaving him free for other duties. This is done by simply adding a steel plate extension hopper to the regular stoker magazine.

Beaumont Coal Weigh Larries are built in seven different sizes—a wide enough range to fulfill the requirements of the small industrial boiler plant up to the largest central station.

A ticket recorder attached to the scale beam enables the larry operator to keep an accurate check on all coal consumed. Individual boiler consumption can be recorded, if desired.

All the coal in an overhead bunker is available when a larry is used, because the larry travels the full length of the bunker. Gates are spaced close together, leaving a very small amount of "dead" coal in the bunker.

Advantages of The Beaumont Coal Weigh Larry

1. An Accurate Record of all coal burned by each boiler is secured by the use of a ticket recorder on the scale beam. Thus the efficiency of any boiler may be determined or the efficiency of the entire plant, as desired.

2. Little Dead Coal in Bunker. The use of a larry permits a very close spacing of gates under the bunker, leaving very little dead coal in the bunker.

3. All Coal Available. If any boiler is out of service, the coal in the bunker opposite that boiler is available for any other boiler. (Impossible with chutes.)

4. Stoker Extension Hoppers are added to the stoker magazines and enough coal is discharged to the stoker in a few minutes to last for several hours.

5. Clear Firing Aisle. The firing aisle is clear of all obstructions, permitting easy cleaning of boilers, removal of tubes, etc.

6. Eliminates Gate Operating Chains. Beaumont larries are equipped with a patented mechanism to interlock with and open the bunker gates, thus preventing the opening of a gate unless the larry is under the gate. This eliminates an unsightly collection of gate chains, prevents spill to the floor, and assures that all coal will pass through the larry.

7. Long Internal Bunker Unnecessary. The coal bunker is not necessary for the full length of the firing aisle when a larry is used. It may be at the center or end of boiler house and of small capacity, with reserve storage carried on ground outside. It is

advisable to locate the bunker entirely outside the boiler house, especially where the equipment to handle coal is added to an existing boiler house.

8. Hopper Bottom Bunkers Unnecessary. With a larry, the use of hopper bottom bunkers is not required, as with stoker chutes. Hoppers wear out from coal sliding on them, which scrapes off the protective coating.

9. Fills Stokers Properly. A larry distributes the coal uniformly over the full length of the stoker magazine, while with spreader chutes lumps separate from the fine coal and roll to the sides of the stoker. In some types of stokers this causes troublesome and inefficient firing.

10. Boiler Cleaning Platform. A traveling platform may be hung from larry tracks to be used when cleaning boilers, removing tubes, etc. This platform is propelled by the larry and when not in use is parked at the end of the boiler house.

11. Fights Fire. The larry will fight fire in any part of the bunker. Coal is taken from the burning section and delivered to all boilers. This is impossible with stoker chutes.

12. Larry Means Economy. The larry permits the use of an external coal bunker, giving less expensive bunker and building construction, more light and air to the boiler room and more economical building construction.

13. Coal Cannot Clog. With stoker chutes the coal sometimes clogs in the chute unknown to the fireman. This cannot happen with a larry, as each discharge is visible after weighing and recording.

14. Ease of Operation. Beaumont larries are built so that all control levers lead to a central point, securing easy and efficient operation.

The Beaumont Coal Weigh Larry for Boilers

TO determine the capacity in tons per hour for a larry under a given condition, enter chart at "Length of average run," go horizontally to speed of larry desired, then vertically to capacity of larry, then horizontally to outer right vertical line, then downward at 45 degrees. Enter again at capacity of stoker hopper, run upward at 45 degrees to intersection of other 45 degree line, then downward to tons per hour.

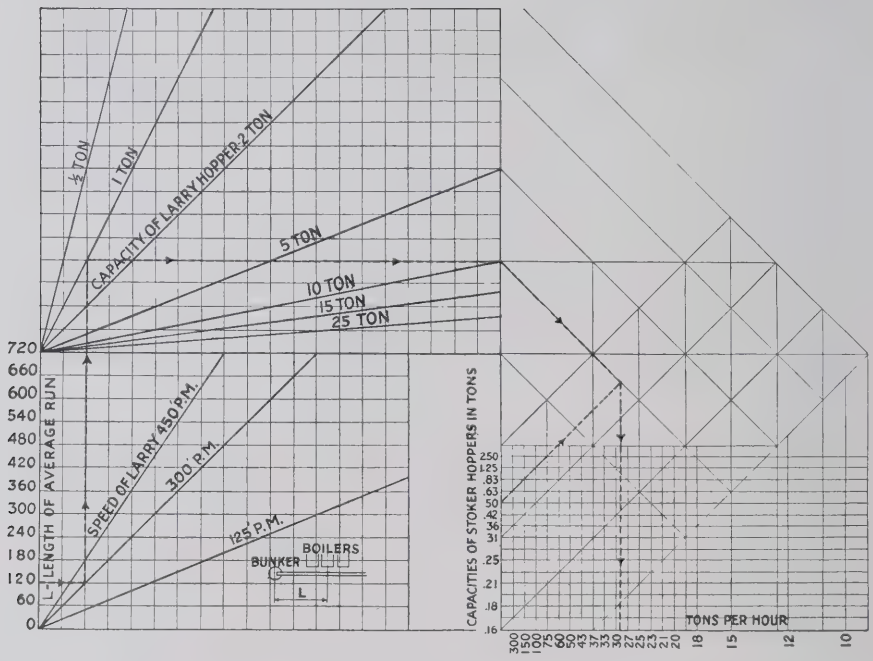


Chart Giving Beaumont Coal Weigh Larry Capacities

Example

L	= 120
Speed	= 300
Capacity	= 1 ton
Stoker Hoppers	= .5
Tons per Hour	= 29

This chart is for 12-inch bunker gates and 12-inch larry discharge chutes. Capacities can be increased 10 to 15 per cent by using larger gates and chutes.

The Beaumont Coal Weigh Larry for Boilers

Capacity	Operation	Motor H. P.	Speed Ft. per Min.	Symbol
1000 lbs.	Hand propelled, floor operated	....	..	0-HPFO
1 ton	Motor driven, cage operated	2	300	1-MDCO
1 ton	Motor driven, floor operated	2	125	1-MDFO
2 ton	Motor driven, cage operated	3	300	2-MDCO
2 ton	Motor driven, floor operated	2	125	2-MDFO
5 ton	Motor driven, cage operated	7½	300	5-MDCO (Standard or Wide Gauge)
10 ton	Motor driven, cage operated	15	300	10-MDCO
15 ton	Motor driven, cage operated	20	450	15-MDCO
25 ton	Motor driven, cage operated	30	450	25-MDCO
1 ton	Floor car type, gravity discharge	3	300	1-MDFG
2 ton	Floor car type, gravity discharge	5	300	2-MDFG
1 ton	Floor car type, power discharge	3	300	1-MDFP
2 ton	Floor car type, power discharge	5	300	2-MDFP
1 ton	Elevated car type	3	300	1-MDEC
2 ton	Elevated car type	5	300	2-MDEC

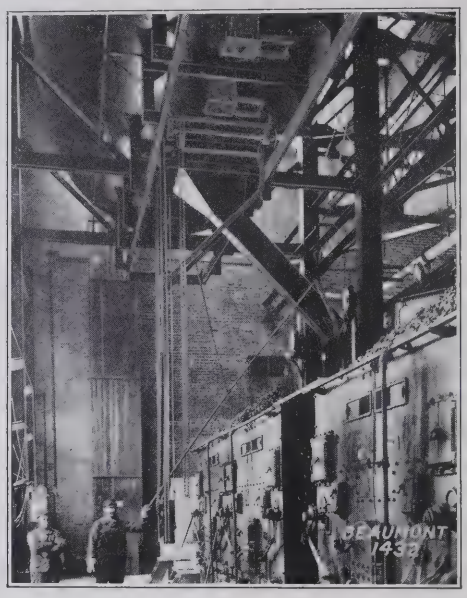
ALL larries are motor driven except the 1000-pound Floor Operated Larry, which is hand propelled.

A platform for the operator to ride on may be applied to 1- and 2-ton, floor operated larries, in which case speed is usually increased to 300 feet per minute. See page 139.

Floor car type is used when overhead tracks are objectionable or would interfere with cross pipes, and where track has curves and switches.

The Power Discharge type larry is used only in cases of excessively low headroom, where the Gravity Discharge type cannot be used.

Elevated Car type is used where the path of the tracks will not permit either overhead suspended tracks or floor tracks.



Beaumont Coal Weigh Larry

1000 pound—Hand-Propelled—Type 0–HPFO

Specifications

TYPE. Floor operated.

CAPACITY. 1000 pounds.

HOPPER is made of 3/16-inch steel plate, stiffened with angles.

CHUTE is made of 3/16-inch steel plate and is 12 inches square. It is provided with a telescopic end, which is fitted with a cast iron pivoted gate.

FRAME AND BEAM BOX are of structural steel and are well braced.

TRUCK WHEELS are 8 inches diameter, single flanged, keyed to through axles and supported in roller bearings. One axle is fitted with 18-inch hand chain wheel. Weight of larry is not hung on bearings.

HAND PROPELLING is accomplished by pushing on the braced beam box. A rag wheel and chain is also furnished.

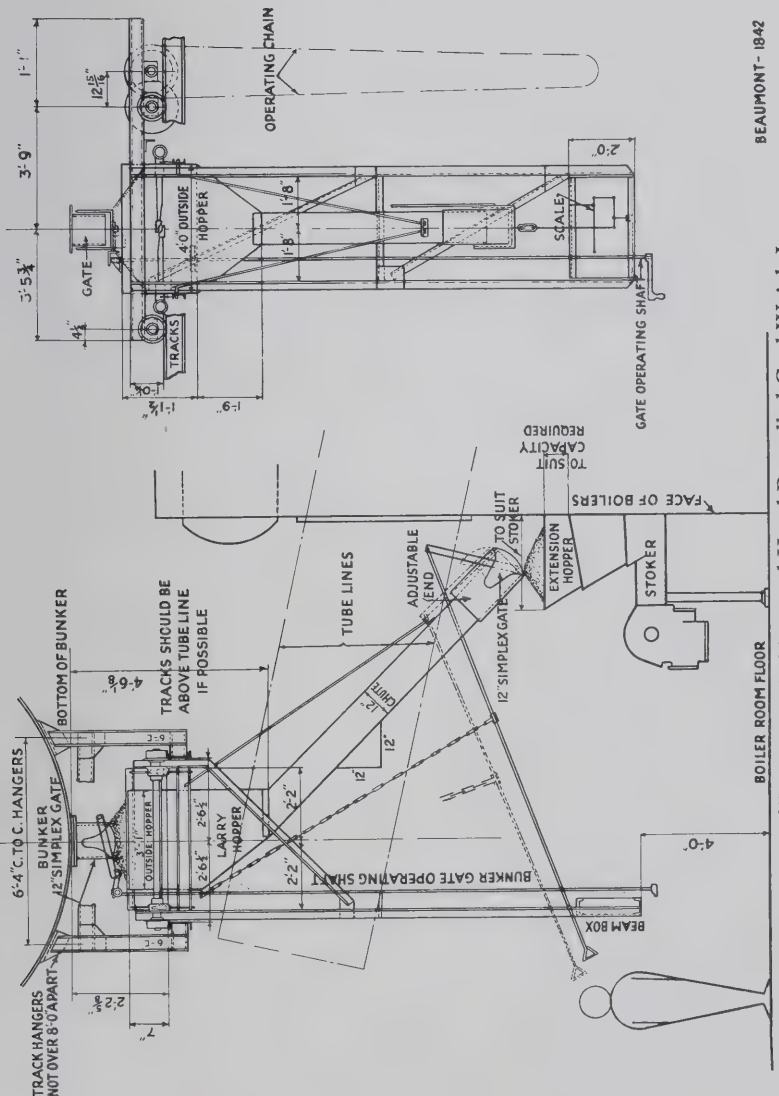
SCALE is a Standard Scale and Supply Company's make (or equal), with the beam box suspended from the frame, about four feet above the floor. On larries operating outdoors scale beam is in a weatherproof box.

TICKET RECORDER will be fitted to beam to record the weight.

LARRY TRACKS consist of two 8-inch by 11½-pound steel channels held rigidly to gauge by steel yokes and supported either from the bottom of the coal bunker by extending the yokes or from the roof trusses by rods which connect to the yokes. In the latter case, side braces are provided to prevent the track swaying. Gauge of track, 5 feet 1 inch.

The Beaumont Coal Weigh Larry

1000-pound Hand-Propelled



Layout of Beaumont 1000-pound Hand Propelled Coal Weigh Larry
Type 0-HPFO

The Beaumont Coal Weigh Larry

1 to 5 Tons—Motor Driven

Specifications

TYPE. Either floor operated or cage operated, as specified.

1–MDFO 1–MDCO 2–MDFO 2–MDCO 5–MDCO

SPEEDS. 125 feet per minute, floor operated, and 300 feet per minute, cage operated.

CAPACITY. One to five net tons at 40 cubic feet per ton.

HOPPER is made of 3/16-inch steel plate, stiffened with angles.

CHUTE is 12 inches square and made of 3/16-inch steel plate. It is fitted with a telescopic end and cast iron pivoted gate. When two chutes are used, rack and pinion gate is at top of chute, and is operated by chain and rag wheel.

FRAME AND CAGE are of structural steel and well braced. The cage is designed so that the operator can see fore and aft and also into the stoker magazine. Floor is of wood. Controller, scale beam and gate levers are located conveniently in the cage.

TRUCK WHEELS will be 8-inch single flanged for capacity of one ton and 12-inch double flanged for the larger sizes. They are keyed to through axles, one axle being geared to driving countershaft. Bearings are of the split rocker type, babbited and fitted with compression grease cups. The weight of the larry is not hung from the bearings.

MOTOR will be General Electric (or equal) type as follows:

For A. C. floor operated larries use continuous rated, high torque, squirrel cage induction type.

For A. C. cage or platform operated larries use intermittent service slip ring motors.

For all D. C. larries use intermittent service, series wound motors.

Motor sizes are:

2 H. P. for 1–MDFO and 1–MDCO larry
2 H. P. for 2–MDFO larry
3 H. P. for 2–MDCO larry
7½ H. P. for 5–MDCO larry

We recommend low voltages, 110 or 220 volts, on account of danger from high voltages on exposed conductor rails.

CONTROLLER is General Electric (or equal) fitted with spring handle and is designed to operate the larry at a slow speed when filling the stokers while in motion.

GEARING. Motor pinion will be cut steel and master gear cut cast iron.

COLLECTORS are of the cast iron slide type mounted on fiber insulators.

CONDUCTOR RAILS consist of 2-inch by 2-inch by 3/16-inch steel angles mounted on standard mine type insulators and supported by the larry track.

SCALE is a Standard Scale and Supply Company's make (or equal), with the beam box either in the cage or suspended from the frame, four feet above the floor, in the floor operated type. On larries operating outdoors, scale beam is in a weatherproof box. An electric lamp is provided in beam box for lighting scale.

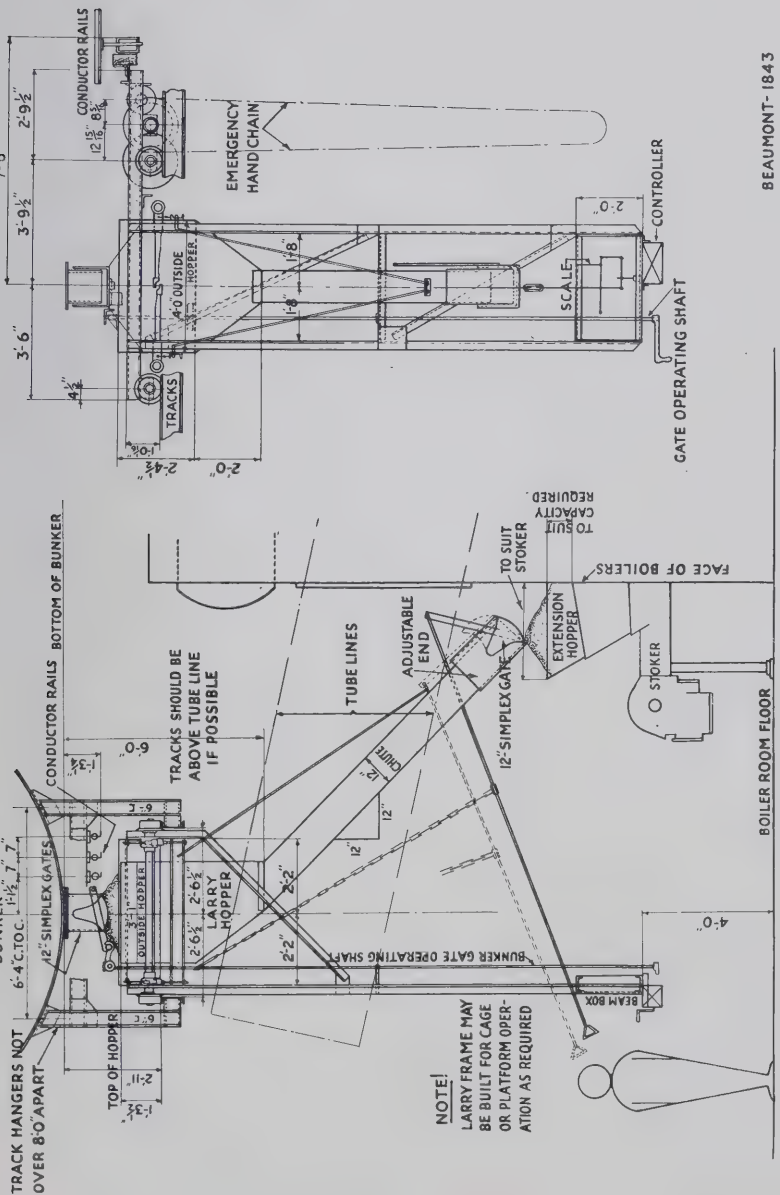
TICKET RECORDER will be fitted to beam to record the weights.

LARRY TRACKS for one-ton larry are 8-inch by 11¼-pound channels; for two- and five-ton larries are 20-pound T-rails, supported by steel beams of suitable size. Track gauge, one-ton, 5 feet 1 inch. Two- to five-ton, 7 feet 8 inches centers of rails.

HAND PROPELLING. A rag wheel and chain is furnished for propelling the larry by hand in case of a motor breakdown or current failure.

The Beaumont Coal Weigh Larry

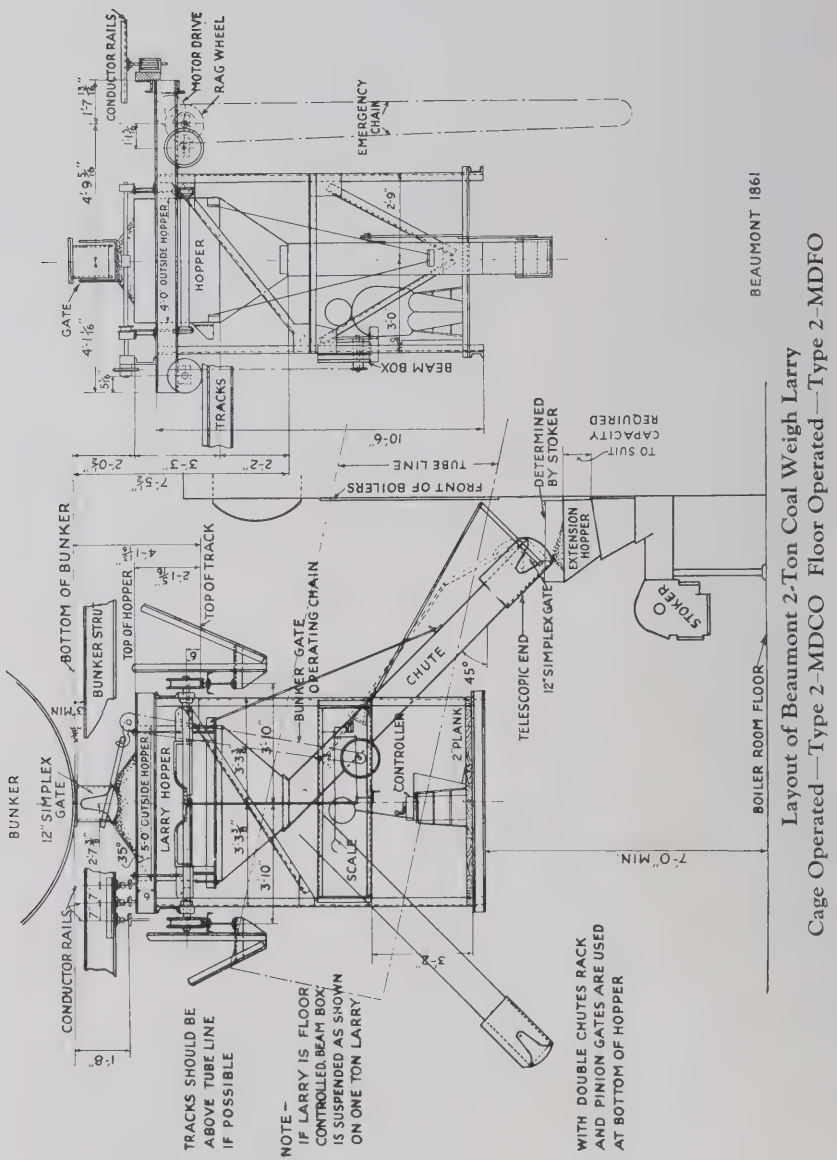
1-Ton—Motor Driven—Floor or Cage Operated



Layout of Beaumont 1-Ton Coal Weigh Larry
Cage Operated—Type 1-MDCO Floor Operated—Type 1-MDFO

The Beaumont Coal Weigh Larry

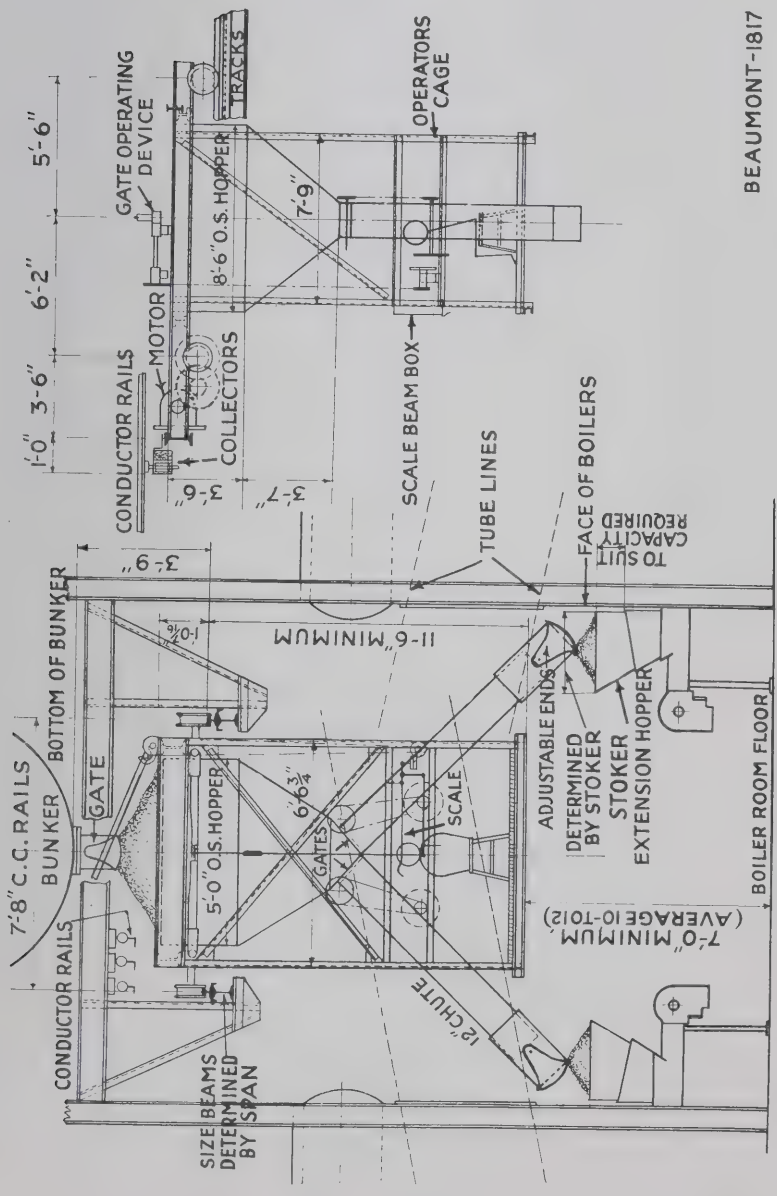
2-Ton—Motor Driven—Cage Operated



Layout of Beaumont 2-Ton Coal Weigh Larry
Cage Operated—Type 2-MDCO Floor Operated—Type 2-MDFO

The Beaumont Coal Weigh Larry

5-Ton—Motor Driven—Cage Operated



Layout of Beaumont 5-Ton Coal Weigh Larry
Type 5-MDCO Standard Gauge

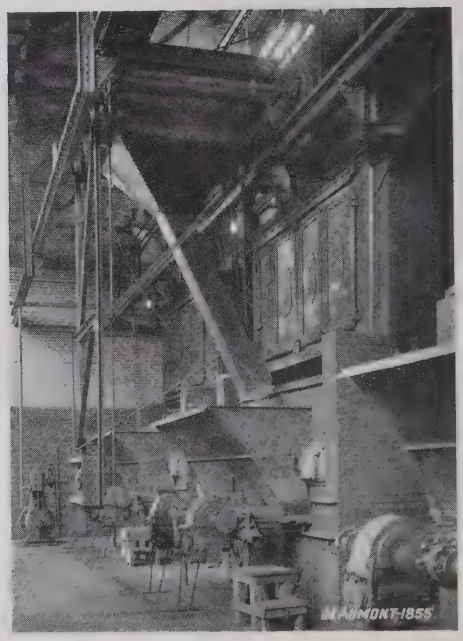
The Beaumont Coal Weigh Larry

1-Ton
Motor Driven
Cage-Operated Larry

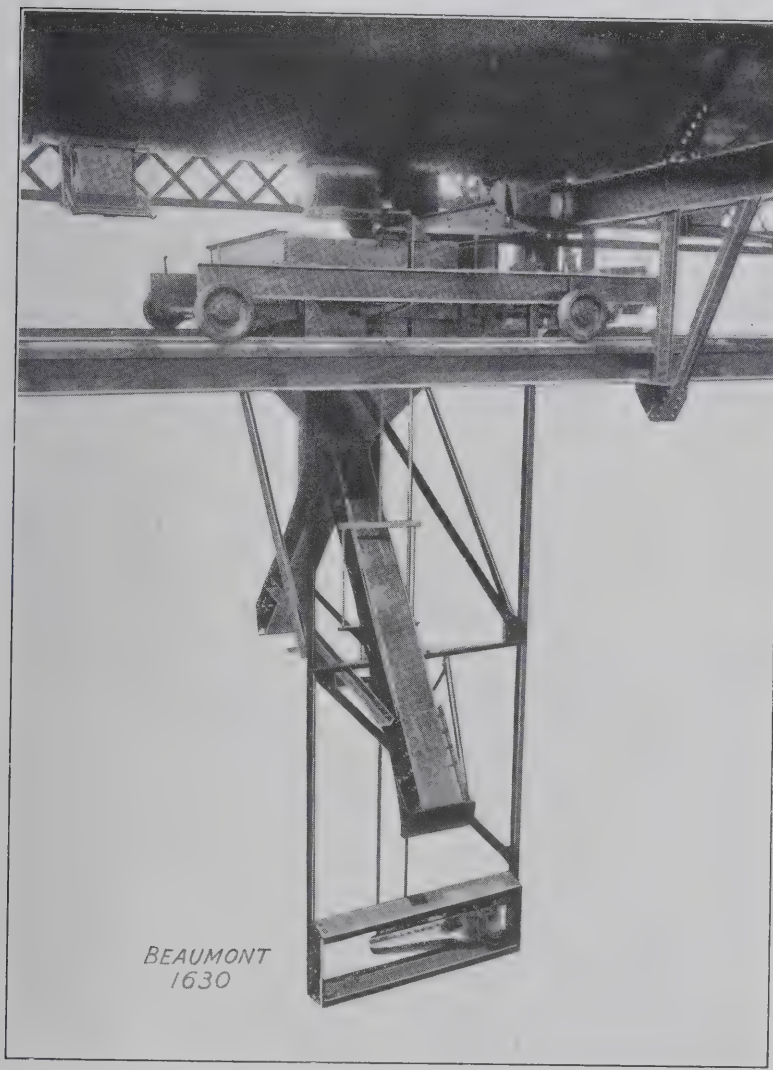
Type 1–MDCO

1-Ton
Motor Driven
Floor-Operated Larry

Type 1–MDFO



The Beaumont Coal Weigh Larry



2-Ton Motor Driven Floor Operated Larry

Type 2–MDFO

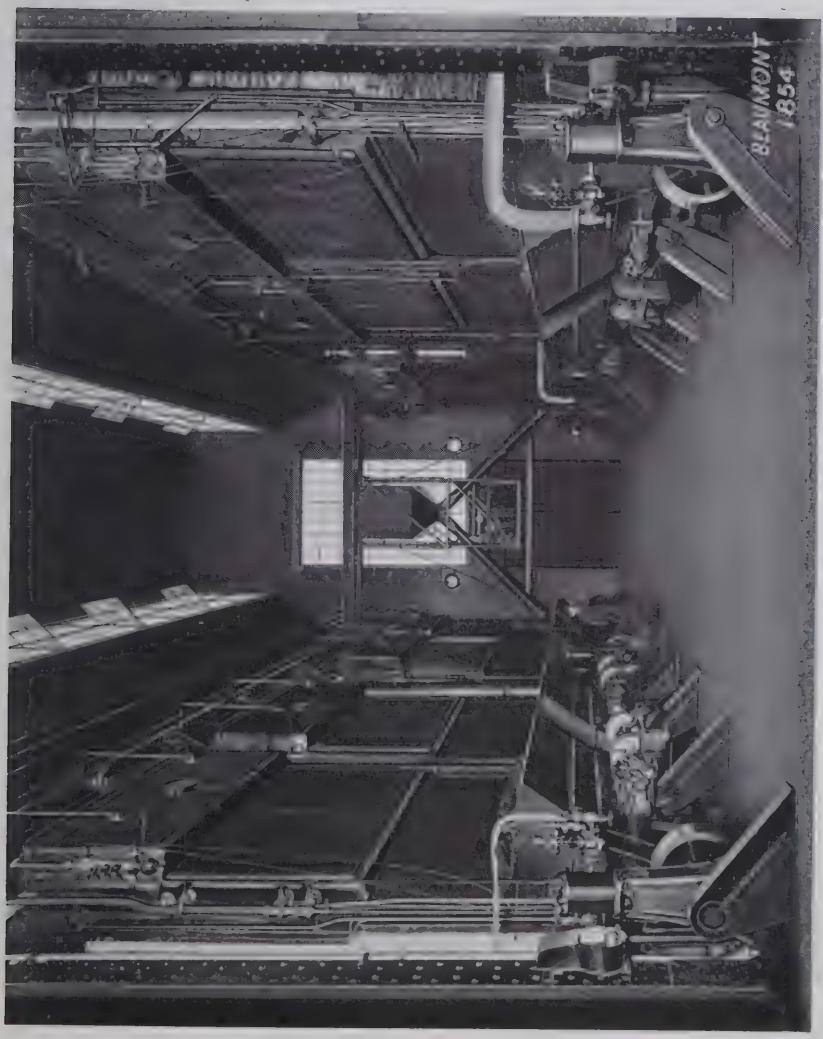
THE Beaumont Coal Weigh Larry weighs each boiler's coal. A ticket recorder attached to the scale gives a permanent record of coal consumed individually and collectively by the boilers.

The Beaumont Coal Weigh Larry

2-Ton Motor Driven Cage Operated Larry. Type 2–MDCO

COAL bunker is located at the end of the boiler house. Stokers are provided with extension hoppers to enable the larry operator to feed four or five hours' run to the boilers at one time.

The Beaumont Coal Weigh Larry



5-Ton Motor Driven Cage Operated Larry
Type 5-MDCO Wide Gauge

The Beaumont Coal Weigh Larry

5-, 10-, 15- and 25-Ton—Motor Driven—Cage Operated

Specifications

TYPES. 5–MDCO Wide Gauge 15–MDCO Wide Gauge
10–MDCO Wide Gauge 25–MDCO Wide Gauge

SPEEDS. 5– and 10–MDCO larry speed 300 feet per minute. 15– and 25–MDCO speed 450 feet per minute.

CAPACITY. Five, ten, fifteen and twenty-five net tons at 40 cubic feet per ton.

HOPPER is made of ¼-inch steel plate, stiffened with angles.

CHUTE is 16 inches square, made of ¼-inch steel plate. It is fitted with a telescopic end. The gate is at top of chute, of rack and pinion type, and is operated by chain and sprockets, connected to hand wheel.

FRAME AND CAGE are of structural steel, well braced. The cage is designed so that the operator can see fore and aft and also into the stoker magazine. Floor is of wood. Controller, scale beam and gate levers are located conveniently in the cage.

TRUCK WHEELS are double flanged, 12 inches diameter for 5-, 10- and 15-ton larries and 16 inches for 25-ton. They are keyed to through axles, one axle being geared to driving countershaft. Bearings are of the split rocker type, babbitted and fitted with compression grease cups. The weight of the larry is not hung from the bearings.

MOTOR will be General Electric (or equal), constant speed, intermittent service, slip ring type for alternating current. For direct current, motors are intermittent service series wound.

Sizes will be:

7½ H.P. for 5-ton larry 20 H.P. for 15-ton larry
15 H.P. for 10-ton larry 30 H.P. for 25-ton larry

We recommend low voltage, 220 volts, on account of danger from higher voltages on exposed conductor rails.

CONTROLLER is the reversing drum type (General Electric or equal) fitted with spring handle.

GEARING. Pinions will be cut steel, gears cut cast iron

BRAKE. An automatic, electric operated, magnetic brake of the shoe type is applied to the motor shaft; this stops the larry instantly when the current is cut off.

COLLECTORS are of the cast iron slide type, mounted on fiber insulators.

CONDUCTOR RAILS consist of 2-inch by 2-inch by 3/16-inch steel angles mounted on Standard mine type insulators and supported by the larry track.

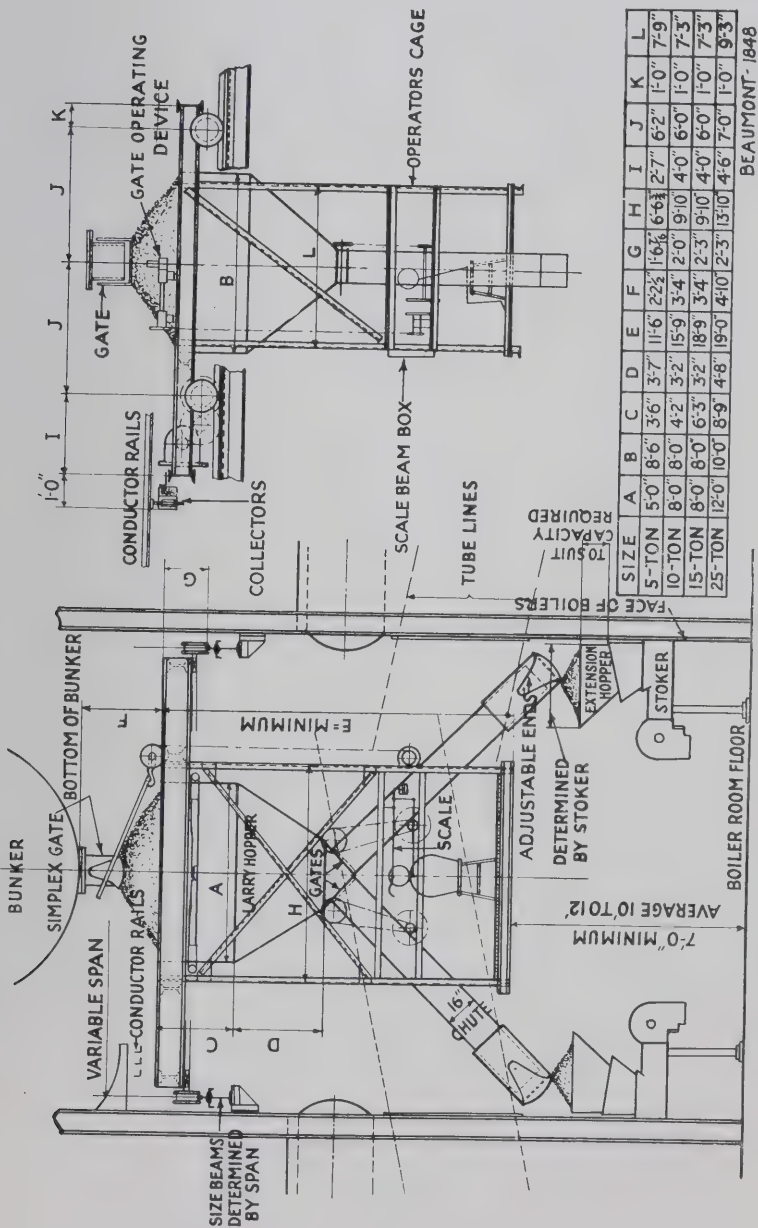
SCALE is a Standard Scale and Supply Company's make (or equal) with the beam box in the cage. On larries operating outdoors, scale beam is in a weatherproof box. An electric lamp is provided in beam box for lighting scale.

TICKET RECORDER will be fitted to beam to record the weights.

LARRY TRACKS are standard T-rails, supported on structural steel stringers to suit conditions.

The Beaumont Coal Weigh Larry

5-, 10-, 15- and 25-Ton—Motor Driven—Cage Operated

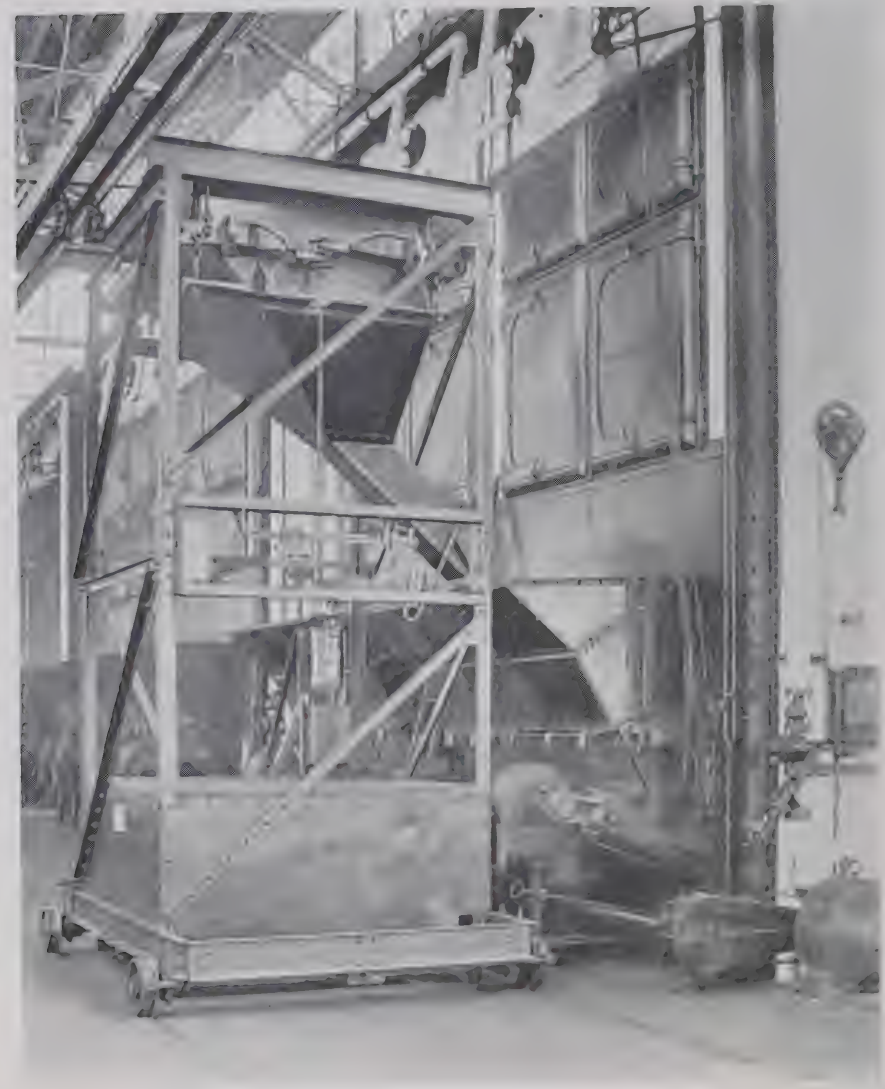


SIZE	A	B	C	D	E	F	G	H	I	J	K	L
5-TON	5'-0"	8'-6"	3'-6"	3'-7"	11'-6"	2'-2½"	1'-6½"	6'-6½"	2'-7"	6'-2"	1'-0"	7'-9"
10-TON	8'-0"	8'-0"	4'-2"	3'-2"	15'-9"	3'-4"	2'-0"	9'-10"	4'-0"	6'-0"	1'-0"	7'-3"
15-TON	8'-0"	8'-0"	6'-3"	3'-2"	18'-9"	3'-4"	2'-3"	9'-10"	4'-0"	6'-0"	1'-0"	7'-3"
25-TON	12'-0"	10'-0"	8'-9"	4'-8"	19'-0"	4'-10"	2'-3"	13'-10"	4'-6"	7'-0"	1'-0"	9'-3"

BEAUMONT - 1848

Layout of Beaumont 5-, 10-, 15- and 25-Ton Coal Weigh Larries
Types 5-MDCO, 10-MDCO, 15-MDCO and 25-MDCO Wide Gauge

The Beaumont Coal Weigh Larry

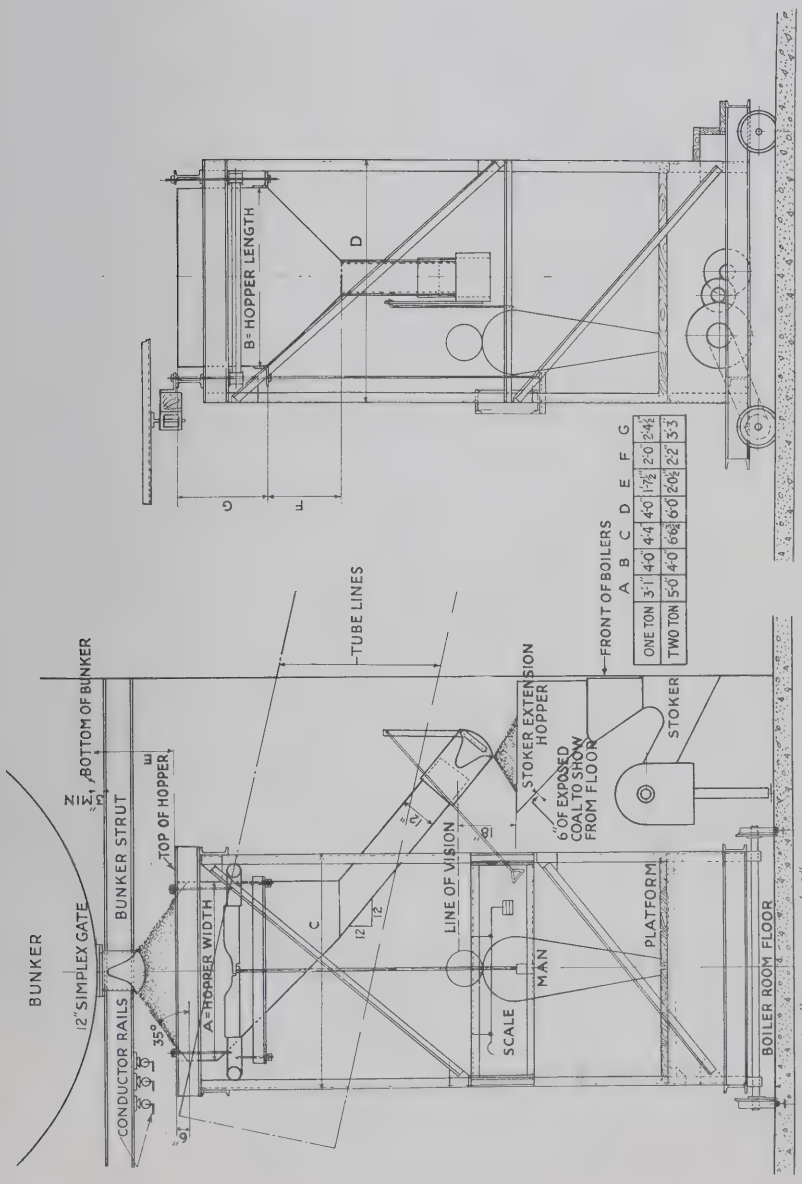


2-Ton Floor Car Type Larry—Type 2–MDFG

THIS Larry is used where overhead tracks are objectionable or would interfere with cross pipes, and where the tracks have curves or switches. Specifications are the same as for the 1- and 2-ton, cage operated larry, excepting motor, which is 3 H.P. for the 1-ton size and 5 H.P. for the 2-ton size. Larry tracks are 20-pound T-rails. Speed 300 feet per minute.

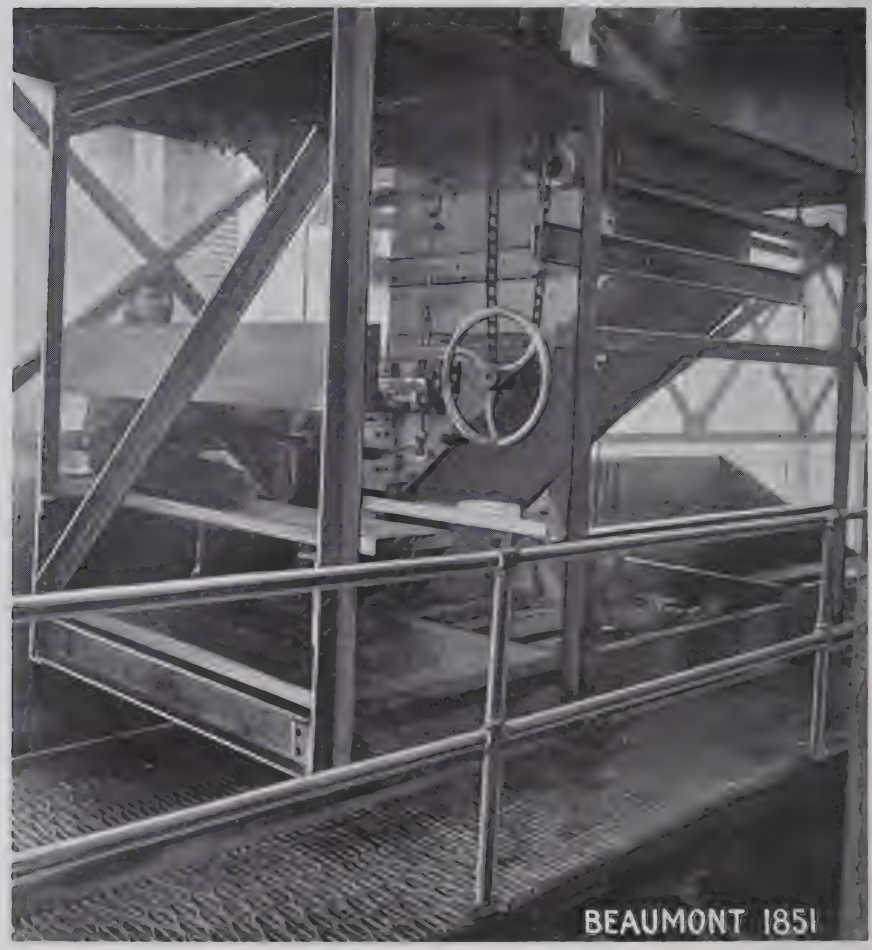
The Beaumont Coal Weigh Larry

1- and 2-Ton Floor Car Type



Layout of Beaumont 1- and 2-Ton Floor Car Type Coal Weigh Larry
Types 1-MDFG and 2-MDFG

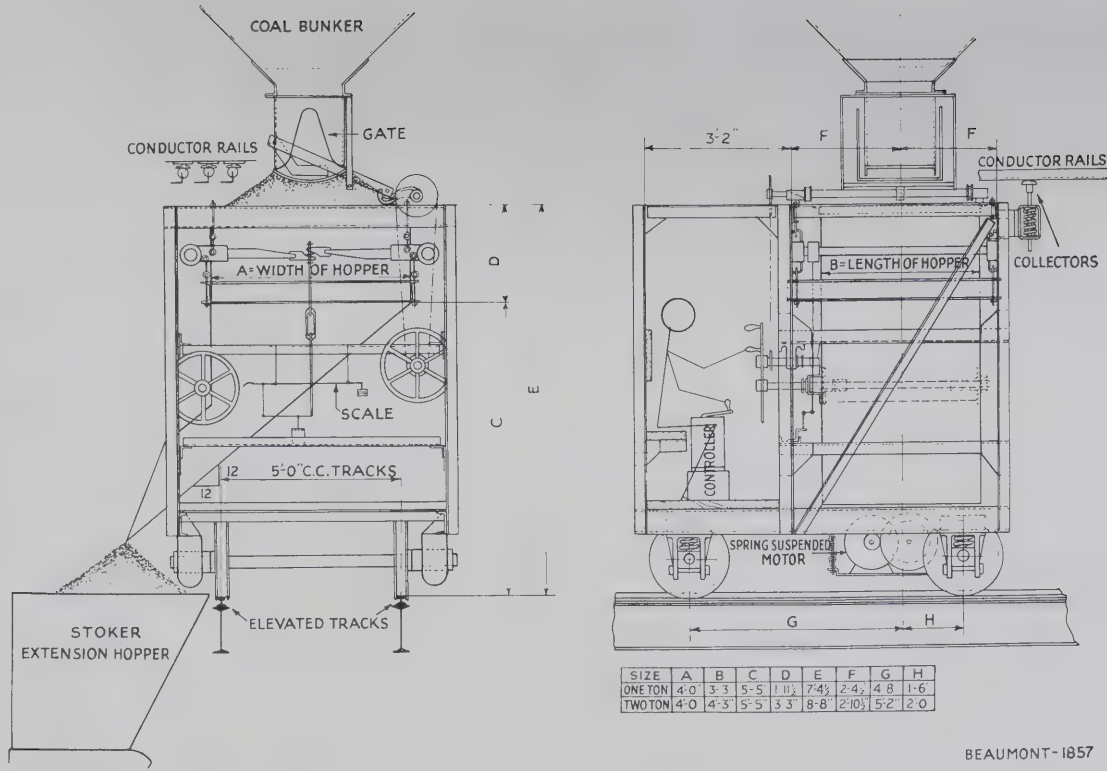
The Beaumont Coal Weigh Larry



1-Ton Elevated Car Type Larry
Types 1–MDEC and 2–MDEC

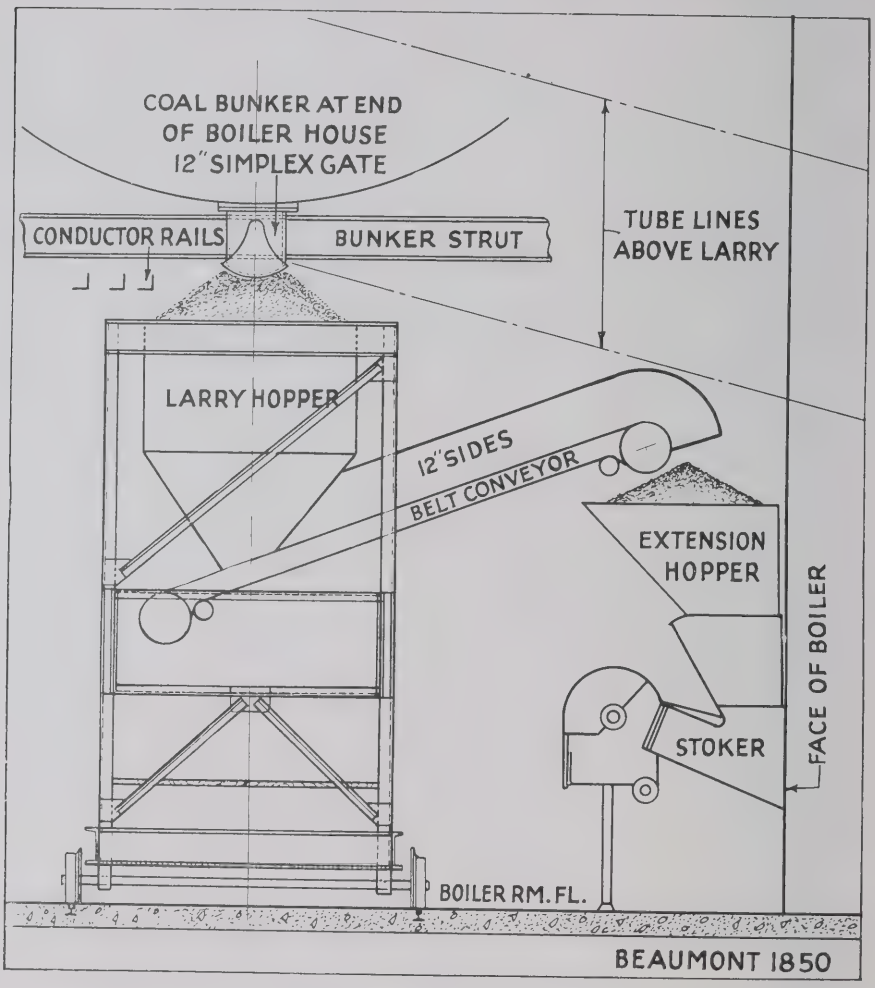
THIS type of Larry is used only where the path of the tracks will not permit either overhead suspended tracks or floor tracks. Specifications for this machine are the same as for the 1- and 2-ton, cage-operated larries, except that the motor is 3 H.P. for the 1-ton size and 5 H.P. for the 2-ton size. Tracks are 20-pound T-rails mounted on steel beams. Speed 300 feet per minute.

Conductor rails must be located high enough to be out of reach of man on larry or floor.



SIZE	A	B	C	D	E	F	G	H
ONE TON	4'-0"	3'-3"	5'-5"	1' 11½"	7'-4½"	2'-4½"	4'-8"	1'-6"
TWO TON	4'-0"	4'-3"	5'-5"	3'-3"	8'-8"	2'-10½"	5'-2"	2'-0"

Layout of Beaumont 1- and 2-Ton Elevated Car Type Coal Weigh Larry
Types 1–MDEC and 2–MDEC



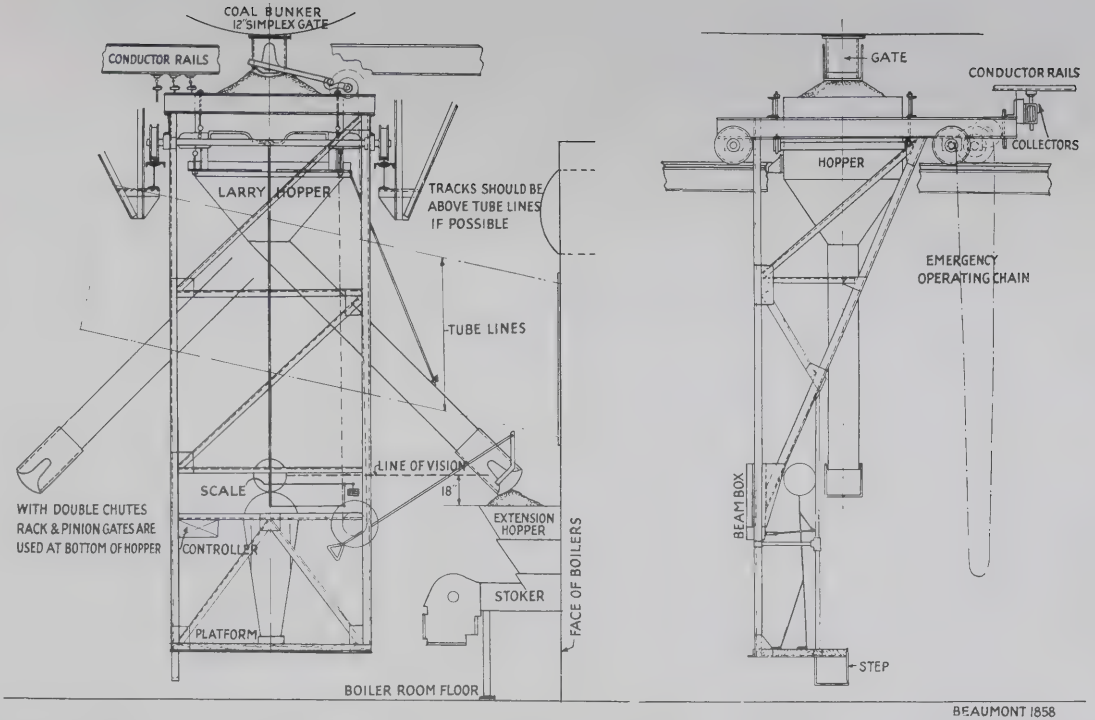
Beaumont Power Discharge Coal Weigh Larry

Types 1–MDFP and 2–MDFP

THIS Larry is used where head room is so limited that the gravity discharge type cannot be used. The specifications for this larry are the same as for the 1- and 2-ton cage-operated larry, except motor, which is 3 H.P. for the 1-ton size and 5 H.P. for the 2-ton size.

Power discharge is accomplished by a 16-inch 5-ply ⅛-inch rubber covered belt conveyor, running on a flat steel plate in a trough with 12-inch high sides. Belt is fitted with cross strips at intervals to carry the coal.

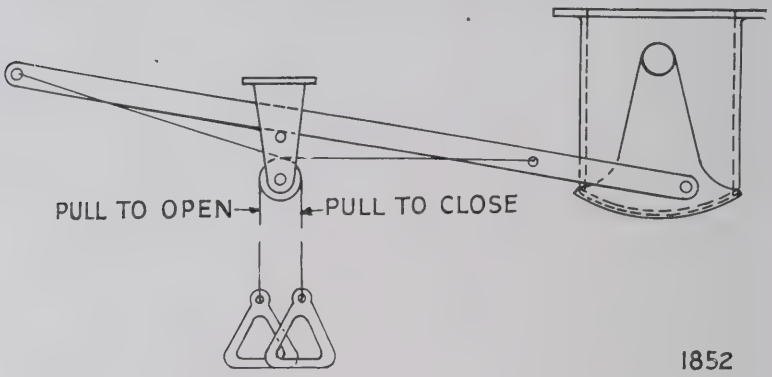
Larry is built in 1- and 2-ton sizes. Speed 300 feet per minute.



Beaumont Coal Weigh Larry Arranged for Platform Operation

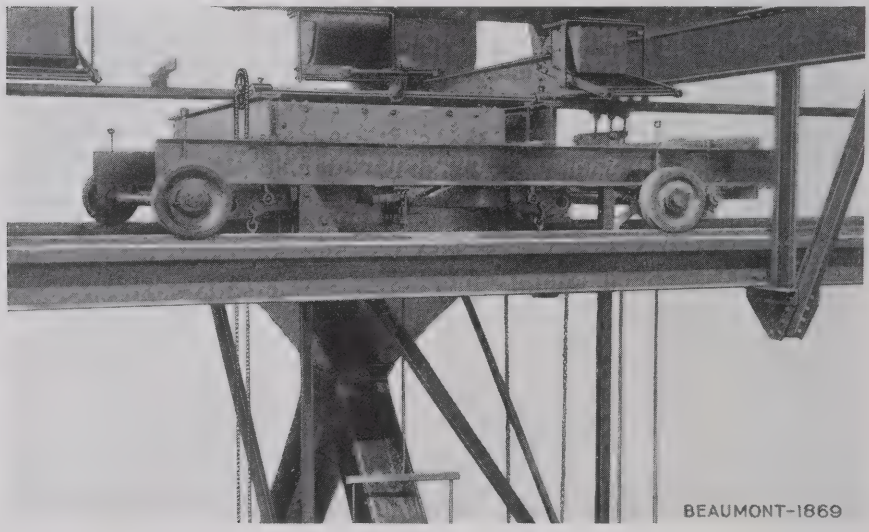
Note that it is necessary for operator to see into stoker hopper; this feature locates height of platform from floor. Usually a step is required to reach platform.

Coal Bunker Gates



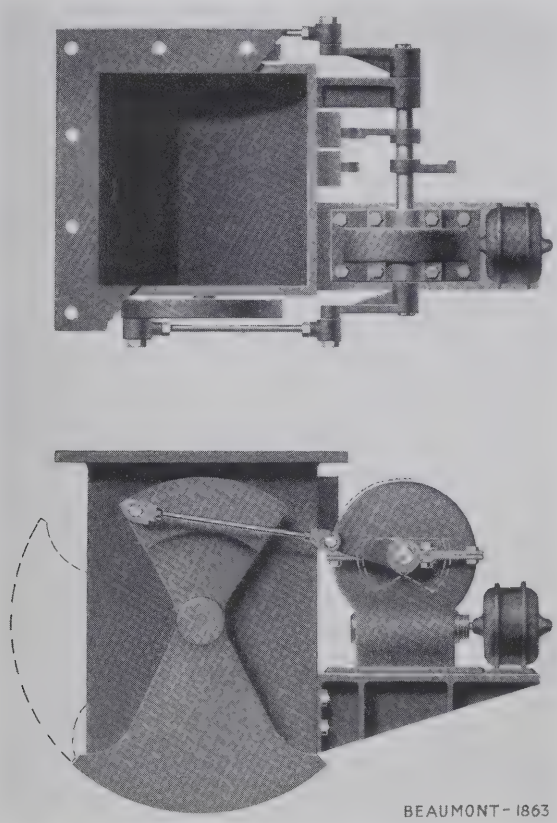
Bunker Gate Operated by Hand Ropes and Lever

FOR bunkers with one, two or three gates, the usual method of gate operation is as shown in the sketch above. The larry operator pulls down on the rope handle, holding it down until larry is filled. By pulling the other handle he closes the gate tight.



ON storage bunkers with four or more outlet gates, we use and strongly recommend the Beaumont Patented Larry Gate-Operating Mechanism shown above. The larry is stopped under the gate and larry operator opens gate by turning a hand wheel in the larry cage, or under the scale box in case of floor operation. The hand wheel turns a shaft connected with a latch which engages the gate.

The use of this mechanism eliminates the unsightly collection of gate-operating chains, etc. It also makes gate operation easier and simpler. All coal must be passed through the larry before going to stokers, and no coal can be accidentally spilled on the floor. For sizes of gates see page 228.



Motor Operated Bunker Gates

FOR boiler houses consuming large quantities of coal an essential feature is the quick loading of the larry, This is accomplished by the Beaumont Motor Operated Simplex Gate.

Specifications

GATE is of the cast iron Simplex type, having a 24-inch square body. It is opened by a crank and connecting rod driven through a worm gear by a ½ H.P. motor.

CONTROLLER is of the drum type and is mounted within easy reach of the larry operator. Controller has three positions: "Open," "Shut" and "Off." When controller handle is placed in "Open" position, the gate will open fully and remain open. The handle is then thrown to "Closed" and the gate closes and stays closed.

If the gate is being opened or closed and the handle is thrown to "Off" position, the gate will stop in any position where it happens to be.

The controlling apparatus consists of this three-point controller and two-limit switches on the gate, one to stop the gate when it is wide open and one to stop it when it is closed.

Section 3—THE CABLE DRAG SCRAPER

Index

THE BEAUMONT CABLE DRAG SCRAPER FOR STORING AND RECLAIMING COAL

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The Beaumont Cable Drag Scraper

FOR storing and reclaiming coal is advocated by us as the best solution of the coal storage problem. Of the many systems in use, consisting of cranes, conveyors, trestles, etc., none has as many advantages, both mechanical and financial. The system is not new. Placed on the market by us in the fall of 1917 the cable drag scraper achieved an immediate and sweeping success. Since its development by us there have been numerous unsuccessful imitators.

The parts of the equipment which are vital to its successful operation are fully protected by patents either granted or pending.

The Storage of Coal

IN the choice of a storage system the following points should be considered:

1. The location, size and topography of the available storage ground.

2. The capacity of the desired installation, that is, the amount of coal which it is desired to load and unload in a given time.

3. The cost of the plant.

4. The cost of maintenance.

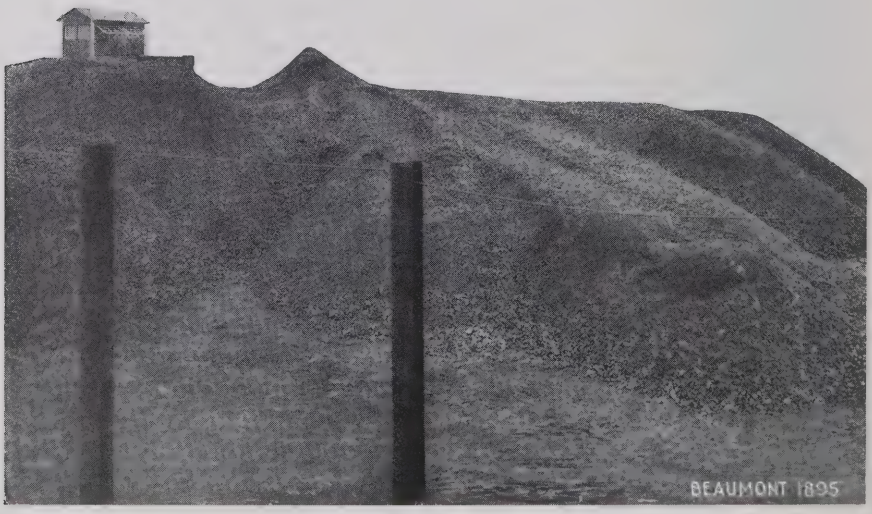
5. The cost of operation.

6. The amount of breakage to be permitted in handling the coal.

7. The way in which the coal is received, in open or in box cars or in boats.

8. The length of time the coal must be kept in storage.

9. Climate—in very cold parts of the country, underwater storage is impracticable for a part of the year.



Requirements of an Ideal Storage Plant

1. Adequate ground area, so that several sizes and varieties of coal may be stored separately. Separation into sizes has not been considered so important for bituminous as for anthracite coal, but it is becoming more important because of the fact that danger of spontaneous combustion is decreased by keeping different sizes separate in storage.

2. Adequate facilities for rapidly and economically transferring coal from cars or from boats into storage.

3. Adequate facilities for rapidly and economically reclaiming the coal and for rapidly moving any part of the pile which shows evidences of taking fire.

4. Adequate trackage, with gravity facilities, if possible, for handling cars.

5. Means for preventing undue breakage in handling.

6. Low cost of installation, maintenance and operation per ton of capacity. A storage plant is in operation very irregularly and costs are likely to be correspondingly higher because of the heavy fixed charges, especially interest and depreciation.

Few, if any, storage plants possess or require all these ideal conditions. Storage facilities must, of course, be adapted to the various requirements and limitations in coal yards, power plants, railroad yards, boat docks, steel plants and other establishments.

The Beaumont Cable Drag Scraper for Coal Storage

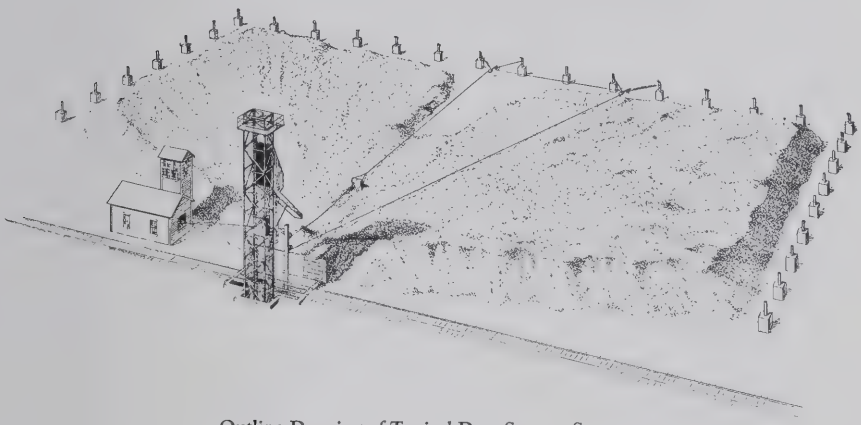
THE Beaumont Cable Drag Scraper is a means of storing a large pile of coal on a piece of ground adjacent to a railroad track and reclaiming it with the same equipment. We advocate the use of this system of ground storage of coal because we believe that the methods now in use, consisting of cranes of various types, have several disadvantages which have not been apparent because they have been the only means available for storing coal.

The disadvantages of the crane systems are: High first cost, dependence on an experienced operator, dependence on a machine shop for repairs, the necessity of using (and maintaining) trestles or conveying equipment to assist the crane in stocking out the coal (a crane cannot travel to store coal, it being too slow).

A railroad trestle to store coal is obsolete because: It is expensive; it is an obstruction to the plant; it does not permit much coal to be stored under it, coal cannot be distributed from the trestle pile conveniently. Railroads definitely abandoned the trestle system twenty years ago. While the trestle permits very rapid dumping of coal, there is no advantage in dumping faster than it can be distributed. There is no adequate return to warrant the high cost of installing a trestle and crane system.

The Drag Scraper System does not have any of the above disadvantages; in fact, it has all of the advantages which the trestle lacks, which make it the most desirable coal storage and reclaiming system now in use. Coal may be stocked out or reclaimed for a labor cost of less than one cent per ton.

IMPORTANT: The outdoor coal storage pile should be in the nature of a reserve, and should not be active; that is, coal should go direct from cars to boiler house, and the machinery must not be arranged so that it is necessary to send coal through or over the storage plant before it goes to the boiler house. The cost of handling coal depends on the number of men and machines required to handle it. It is for this reason that it is necessary to send all coal possible direct from cars to the boiler house and not through the storage pile. The storage pile must be strictly in the nature of a reserve.



Outline Drawing of Typical Drag Scraper System

The Beaumont Cable Drag Scraper for Coal Storage

Description of the System

COAL is received at the plant in railroad cars and discharged into the hopper below the tracks. A skip hoist picks up the coal and delivers it down a chute to form an initial pile ten feet high, adjacent to the railroad track. A machinery house contains the driving drums, to which are attached the ends of a steel cable extending over the storage yard, and having a scraper attached to it. The scraper is dragged back and forth over the coal, it being quickly detachable so that it can be turned around to reclaim the coal. Around the edge of the yard are steel posts. To store coal at any portion of the storage yard, the tail blocks are changed from one post to another.

When reclaiming, the scraper is reversed on the cable and the coal is scraped back to the reclaiming hopper and delivered to the skip hoist which will discharge the coal either to railroad cars or to the boiler house coal bunker.

Note that the operation of reclaiming is identical with the storage operation except that the scraper is reversed. The system either reclaims or stores the coal without any changes or additions other than reversing the scraper.

Advantages of the Cable Drag Scraper

1. Storage Area Any Shape. Storage area can be any shape. The ground need not be level. If it is desired to enlarge the storage, all that is necessary is to shift the back posts to cover a larger area.

2. High Capacity. Capacity per hour is high –50 to 600 tons per hour. (Capacity depends on size scraper used and length of haul.)

3. Operating. The drag scraper can be operated by ordinary labor, thus eliminating any dependence on an expert, high-priced operator, such as is required on a crane. This system reclaims coal at the same speed and ease with which it is stored. The scraper bucket is merely detached and reversed on the cable.

4. Maintenance. The largest part of the investment is in steel and concrete, which have a very low depreciation value. When the machine is idle the rope is wound on the drums and the scraper stored anywhere under cover, the only parts exposed to the weather being the machinery house and back posts. The moving parts are the driving drums, ropes, scraper and sheaves, and of these moving parts ninety per cent are steel. There is less wear and tear on account of the simplicity of the equipment.

5. Fights Fire. This system will attack fire in any part of the pile, digging down to the heart of the fire very quickly so that it can be uncovered and quickly quenched. With a locomotive crane it frequently happens that the crane has to dig its way into the pile before it can reach the fire. Again, with the locomotive crane, the dense fumes and smoke caused by the burning coal prevent the crane operator from getting at the fire, and he is seriously handicapped in his efforts to spread the burning coal so that it can be quenched. This objection does not apply to the drag scraper, because the operator is some distance from the fire.

6. Minimum Dust. When coal is stored near dwellings or mills where flying dust is objectionable, the drag scraper is far superior to any other means of storing coal because all other means drop the coal into the pile and frequently into the railroad car when reclaiming. The drag scraper scrapes the coal along and is practically dustless.

7. High Walls can be built around the storage plant and the architectural appearance of the plant not marred. Other types of coal storage equipment require offensive superstructures or high structures of some sort.

8. Interest on Investment. The cost of the equipment is lower than any other system. When used adjacent to the boiler house, the track hopper, feeder, crusher and elevator are necessary to unload coal, even if no ground storage is carried. This leaves only the driving drums, machinery house, cable sheaves and back posts to be charged against the ground storage, giving an extremely low cost per ton handled.

9. In order to reduce the fire risk, coal must not be dropped onto the storage pile from a single point, so that it forms a cone or inclined surface down which lumps may roll, thus causing the coarse coal to separate from the fine coal. This is one of the principal causes of spontaneous combustion. The coal must be spread evenly, so that the fine coal fills the interstices between the large lumps. (See diagrams on page 151.)

10. Simplest System in Use. Coal is stored for insurance against shut-downs, and should not be rehandled unless necessary. The simplest and least expensive machine, therefore, should be used for this purpose to reduce carrying charges on idle equipment.

11. Handles Lump or Crushed Coal. The drag scraper will handle either run of mine coal or crushed coal for stoker use. When the coal becomes frozen and has to be blasted, the large lumps resulting can be dragged directly to the track hopper and thence to the crusher. In a conveyor system it would be impossible to handle these large lumps at all.

12. Trestle is Eliminated. A trestle would block the property and possibly prevent future development. The trestle is expensive to build and maintain. With the drag scraper there are no buried timbers to form air pockets which start fires (as is the case with a trestle).

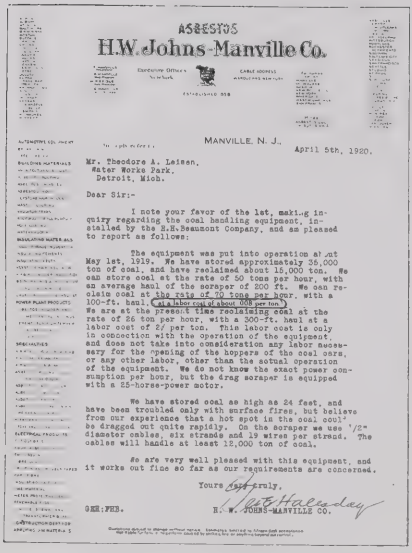
13. High Salvage Value. The salvage value of the plant is high because of its mobility. The only connection between the machinery

house and the back posts is the cable, and it will fit any storage area. The machinery house can be set anywhere. Thus, the entire plant could be moved to a new location very cheaply.

14. Large Storage. Large quantities of coal can be stored without any appreciable increase in price over smaller quantities. A few more back posts are all that would be required.

15. Can be Used as Car Puller by simply extending the countershaft and adding a winch head and outboard bearing. A clutch is provided to throw in car puller when required.

16. Meets "O. M. I. A." Formula. "Operating, maintenance and interest charges" should be worked out in all cases to determine the choice of various systems. Allowance should also be made for the "adaptability" to the present problem and its future possibilities, such as increase in capacity, modification of storage area, etc. The cable drag scraper meets this formula better than any other system.



ASBESTOS

H.W. Johns-Manville Co.

MANVILLE, N. J.,

April 5th, 1920.

Mr. Theodore A. Leisen,
Water Works Park,
Detroit, Mich.

Dear Sir:-

I note your favor of the 1st, making inquiry regarding the coal handling equipment, installed by the R.H. Beaumont Company, and am pleased to report as follows:

The equipment was put into operation about May 1st, 1919. We have stored approximately 26,000 ton of coal, and have reclaimed about 15,000 ton. We can store coal at the rate of 50 tons per hour, with an average haul of the scraper of 200 ft. We can reclaim coal at the rate of 70 tons per hour, with a 100-ft. haul. (at a labor cost of about .008 per ton.) We are at the present time reclaiming coal at the rate of 26 ton per hour, with a 200-ft. haul at a labor cost of 2/ per ton. This labor cost is only in connection with the operation of the equipment, and does not take into consideration any labor necessary for the opening of the hoppers of the coal cars, or any other labor, other than the actual operation of the equipment. We do not know the exact power consumption per hour, but the drag scraper is equipped with a 25-horse-power motor.

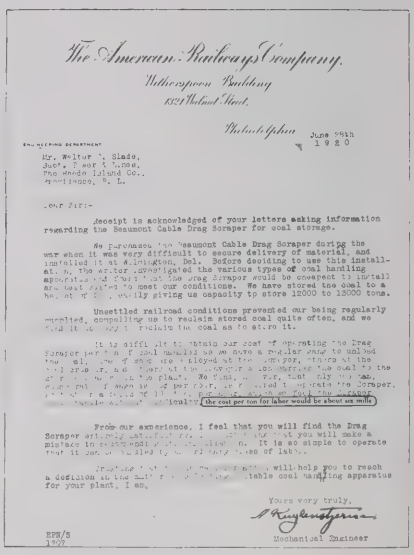
We have stored coal as high as 24 feet, and have been troubled only with surface fires, but believe from our experience that a hot spot in the coal could be dragged out quite rapidly. On the scraper we use 1/2" diameter cables, six strands and 19 wires per strand. The cables will handle at least 12,000 ton of coal.

We are very well pleased with this equipment, and it works out fine so far as our requirements are concerned.

Yours truly,

H. W. JOHNS-MANVILLE CO.

GHE:FEB.



The American Railways Company.

Witherspoon Building
1321 Walnut Street,

Philadelphia June 28th 1920

ENGINEERING DEPARTMENT

Mr. Walter V. Slade,
Asst. Supt. Power,
The Rhode Island Co.,
Providence, R. I.

Dear Sir:-

Receipt is acknowledged of your letters asking information regarding the Beaumont Cable Drag Scraper for coal storage.

We purchased the Beaumont Cable Drag Scraper during the war when it was very difficult to secure delivery of material, and installed it at Arlington, Del. Before deciding to use this installation, we investigated the various types of coal handling apparatus and found that the drag scraper would be cheapest to install and best suited to meet our conditions. We have stored the coal to a height of 24 feet, thereby giving us capacity to store 12000 to 15000 tons.

Unsettled railroad conditions prevented our being regularly supplied, compelling us to reclaim stored coal quite often, and we found it very easy to reclaim the coal as fo stored it.

It is difficult to obtain our cost of operating the Drag Scraper per ton of coal handled as we have a regular gang to unload the coal, [illegible] Lloyd Wharf, Newport, there at the coal dock, and [illegible] We have a [illegible] the coal to the [illegible] plant. However, [illegible] the cost per ton for labor would be about one mill.

From our experience, I feel that you will find the Drag Scraper [illegible] you will make a mistake in not [illegible] It is so simple to operate that it can be handled by [illegible] class of labor.

[illegible] will help you to reach a decision as the best [illegible] coal handling apparatus for your plant, I am,

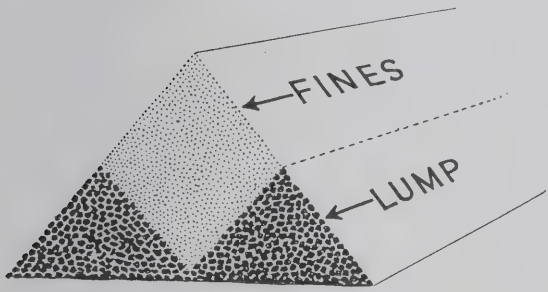
Yours very truly,

Mechanical Engineer

EPP/S
1972

The Beaumont Cable Drag Scraper Stores Coal or Reclaims it for Less Than One Cent a Ton.

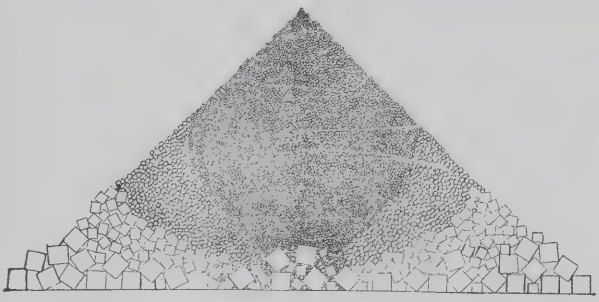
Beaumont Cable Drag Scraper Prevents Spontaneous Combustion



The Effect of Cone Shaped Piling of Coal

See Page 96 Report of Committee on Fuel, Presented at Fortieth Convention, Association of Edison Illuminating Engineers, Spring Lake Beach, N. J., September 12-16, 1921.

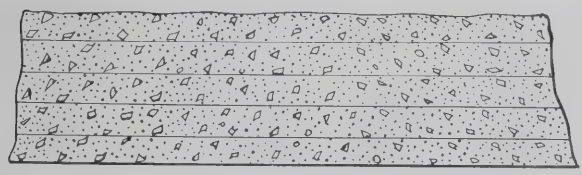
MANY machines pile coal by the "cone" method. That is, the coal is piled by dropping it from a single point or in a straight line. What happens, in this case, is that the lump coal rolls down the sloping sides of the cone pile to the base, thus forming a pile composed of lumps at the base and fine material above. The lumps and the fine material, being separated, are piled in a manner best suited to start and maintain spontaneous combustion in the coal pile, because air is freely admitted to the lumpy strata at the bottom, while the fine coal over the top prevents the escape of heat. If the coal is discharged from trestle, fixed overhead conveyor or monorail telpher, we have the same condition but the shape of the pile is an inverted wedge instead of a cone. Cone, or wedge shaped piling, therefore, must be avoided.



Segregation of Different Sizes of Coal in a Conical Pile

See Page 6, "Factors in the Spontaneous Combustion of Coal," U. S. Government Department of Mines. Technical Paper 311.

The Beaumont Cable Drag Scraper System of storing and reclaiming piles the coal in horizontal layers so that there is no tendency to separate sizes. In fact, there is a decided tendency of the scraper to fill up the interstices with fine coal as it is being dragged out over the storage pile, packing the coal so closely that air cannot enter the pile.



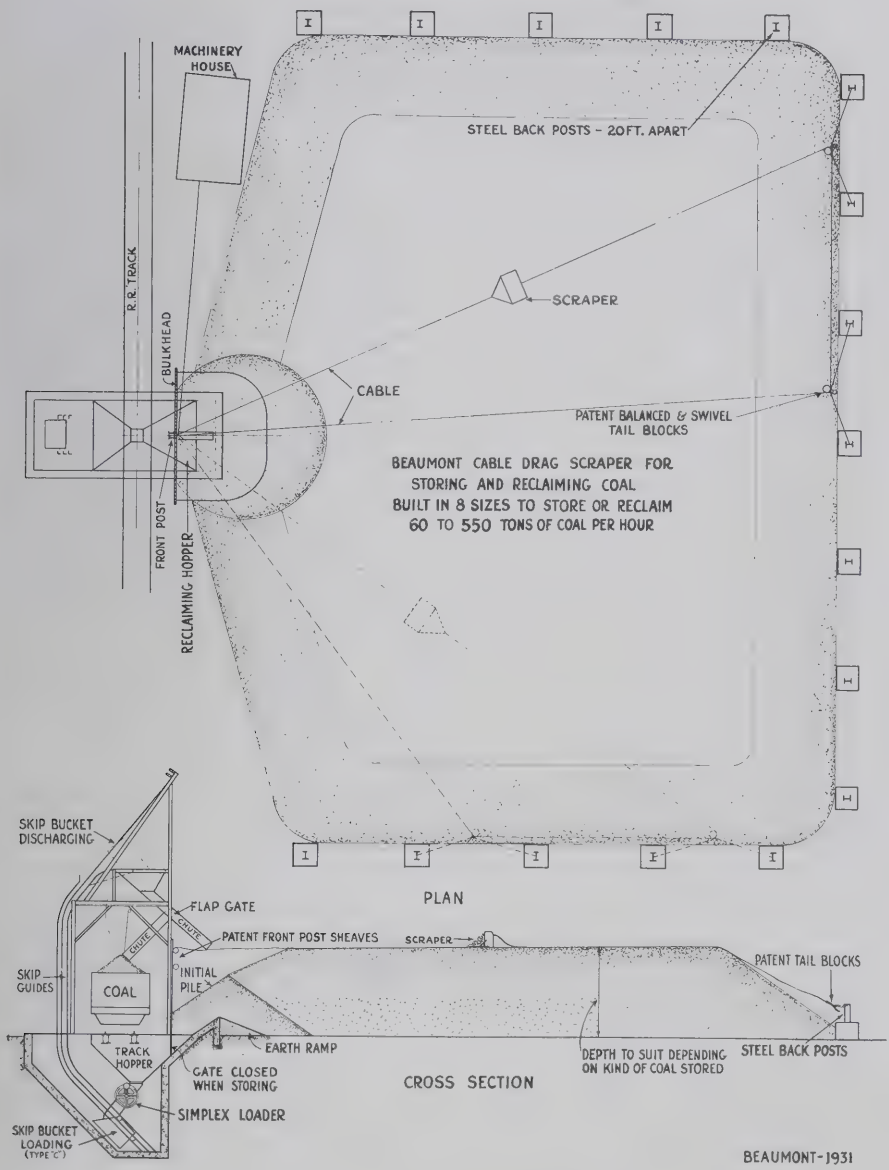
Piling Coal in Horizontal Layers Prevents Spontaneous Combustion

Fine coal fills interstices making a homogeneous mass so that air cannot enter the pile.

The Beaumont Cable Drag Scraper Reclaiming the Coal

THIS photograph shows an actual condition of operation (not a posed picture). The scraper, in reclaiming, cuts for itself a trench in which it operates, if the operator so desires. If he wishes, he may skim the top off the pile a couple of feet at a time, but usually the operation is as pictured above, in order to avoid changing the location of the tail blocks.

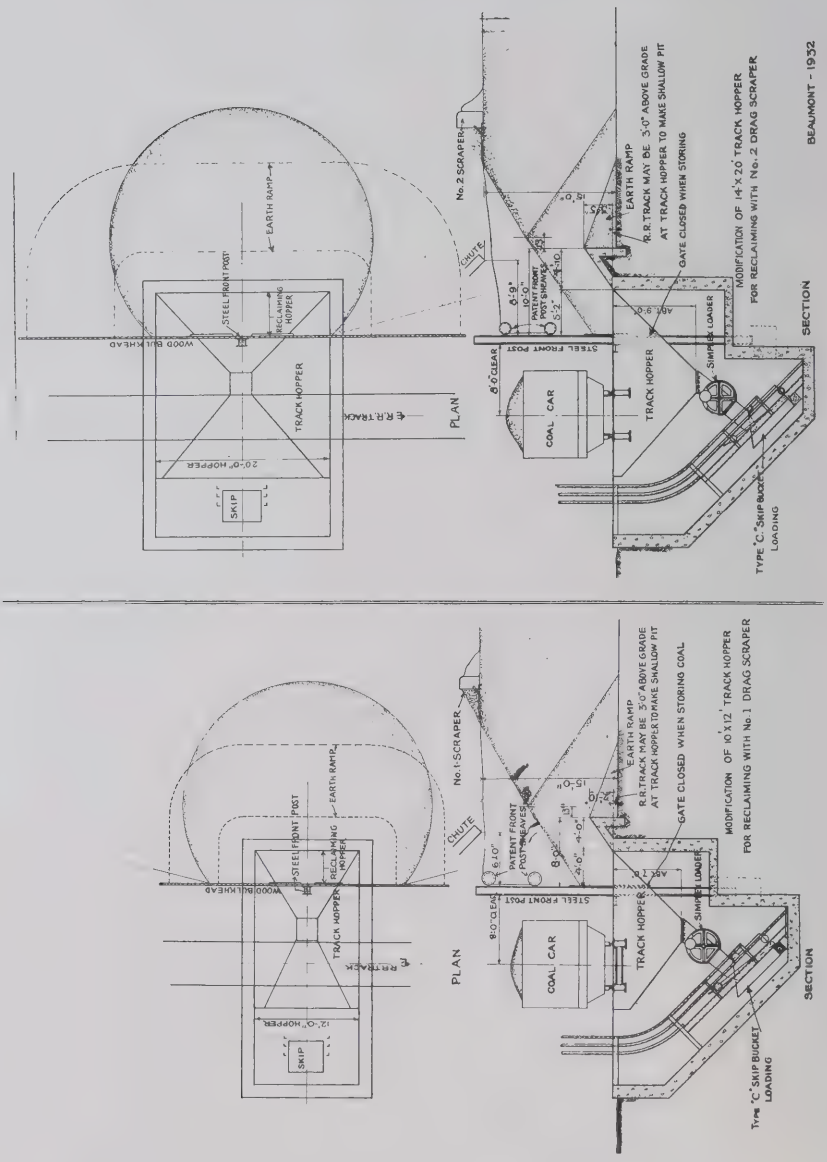
This picture well illustrates and proves our contention that the drag scraper system of coal storage provides better fire-fighting facilities than any other system. It digs quickly to the heart of the fire, exposing the burning coal, and scrapes it to a point where it may easily be quenched. This is accomplished by an operator who controls the movement of the scraper from a tower, which may be several hundred feet from the fire, and consequently he is not smothered by the fumes nor handicapped in any way in fighting the fire.



Plan of Standard System

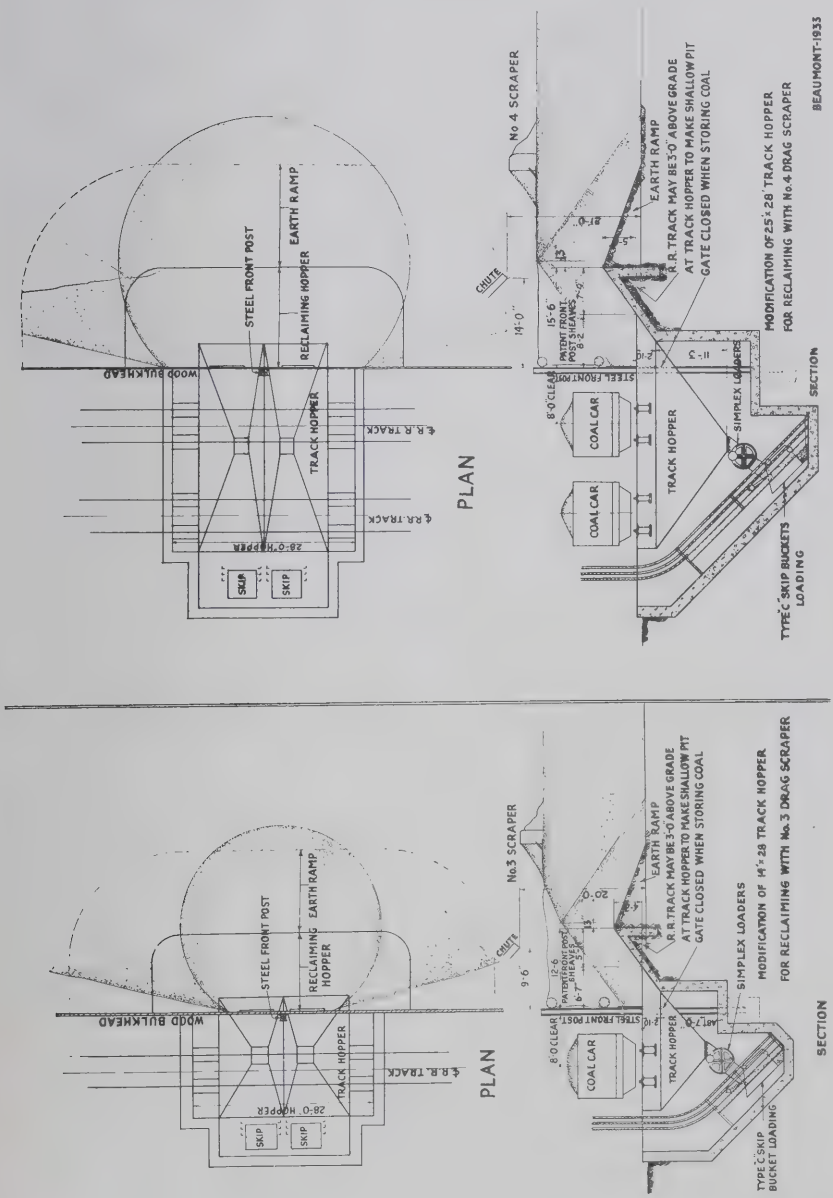
Skip which forms initial pile may be either Vertical or Inclined Discharge type

The Beaumont Cable Drag Scraper

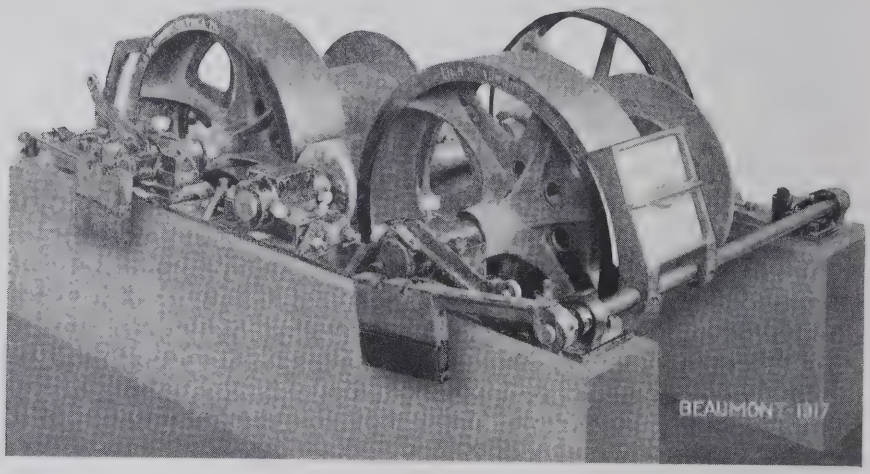

PLAN
SECTION
No. 2 SCRAPER
No. 1 SCRAPER
CHUTE
EARTH RAMP
STEEL FRONT POST
RECLAIMING HOPPER
TRACK HOPPER
WOOD BULKHEAD
SKIP
COAL CAR
SIMPLEX LOADER
R.R. TRACK MAY BE 3'-0" ABOVE GRADE AT TRACK HOPPER TO MAKE SHALLOW PIT
GATE CLOSED WHEN STORING
MODIFICATION OF 14'-X 20' TRACK HOPPER FOR RECLAIMING WITH No. 2 DRAG SCRAPER
MODIFICATION OF 10'X12' TRACK HOPPER FOR RECLAIMING WITH No. 1 DRAG SCRAPER
GATE CLOSED WHEN STORING COAL
TYPE 'C' SKIP BUCKET LOADING
BEAUMONT - 1932

Arrangement of Track Hoppers for Reclaiming Coal

The Beaumont Cable Drag Scraper



Arrangement of Track Hoppers for Reclaiming Coal



No. 1 Driving Drums

THESE consist of a pair of cast iron drums, with large cast iron friction wheels, both drum and wheel being cast in one piece. Between the drums is located the driving shaft, connected by a belt drive to a continuous running motor. On this shaft is a fiber friction pinion, which engages the large drum wheels.

The drum shafts are each mounted in spherical ball and socket bearings on one side, the other end of each shaft being supported by an eccentric bearing (patent applied for), the arms of which are connected to the single control lever by rods. These rods and the eccentric bearings are shown in the photo above.

When in operation the motor runs continually, the control lever being in "neutral" when vertical. Throwing the lever forward causes the rear drum friction wheel to engage the fiber friction pinion, the other drum running idle, its momentum being imparted by the unwinding rope. To prevent this drum gaining in speed, a patented automatic counterweighted brake is used. The machine is reversed by throwing in the control lever in the opposite direction, when the brake will be automatically applied to the other drum.

The entire machine is mounted on cast iron base plates, which are arranged with screw adjustments for all bearings.

No. 1 Driving Drums

Specifications

THE Driving Drums. Drums are cast iron, 18 inches diameter by 24 inches long. Drum pulleys are 42 inches diameter by 10½-inch face and are cast integral with the drums. They are driven by a fiber friction, 12 inches diameter by 11-inch face.

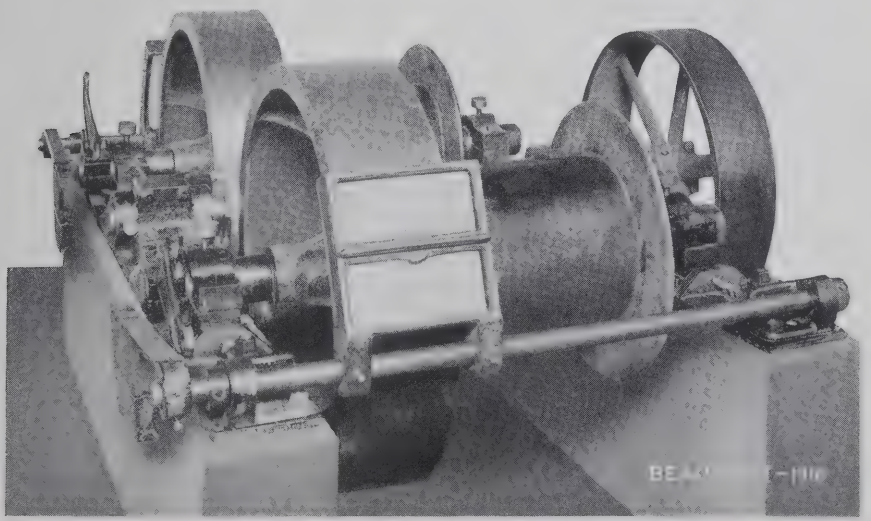
The drum shafts are $2^{15}/_{16}$ inches diameter, mounted in ball and socket bearings on one side and eccentric bearings (patent applied for) on the other side.

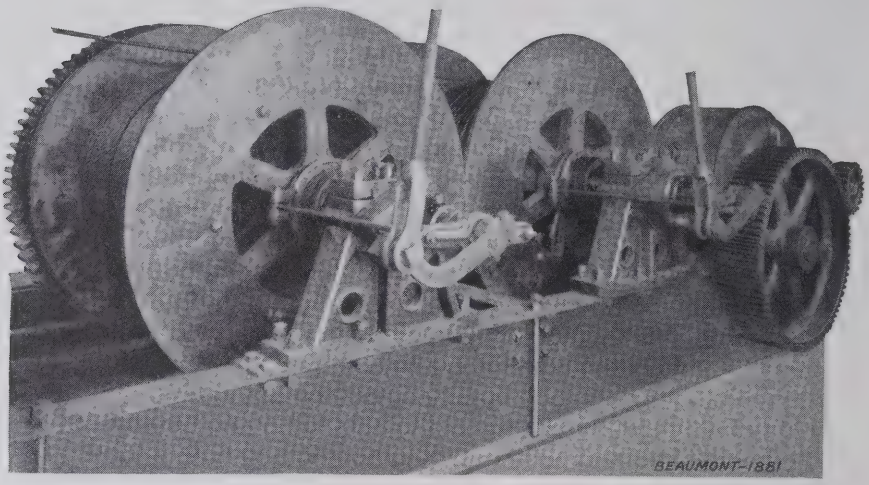
Friction pulley shaft is $3^{15}/_{16}$ inches diameter. Drums are operated by a lever from the operator's tower.

Patent counterweighted brakes are provided on each drum to prevent the unwinding rope from revolving the free drum too rapidly and snarling the rope. Winding drums are mounted on cast iron base plates bolted to concrete piers, bolts being set when concrete is poured.

The motor is belted to the countershaft by a rubber covered belt.

A push button control station is provided in the operator's cabin to throw out motor when desired.





Nos. 2, 3 and 4 Driving Drums

THESE larger capacity driving drums are direct geared, consisting of a pair of tandem friction drums, which revolve freely on their shafts when released from the friction.

Drums are gear driven through one countershaft by an electric motor

The motor drive, countershaft and main gears are in mesh continually while operating and always revolve in the same direction, the drums remaining in "neutral" until one of them is thrown into engagement. This is accomplished by turning a hand wheel in the operator's cabin.

Turning the wheel one way causes the rear drum friction to engage, the other drum running idle, its momentum being imparted by the unwinding rope. To prevent this drum gaining in speed, a patented automatic counterweighted band brake is used. The machine is reversed by throwing the control wheel in the opposite direction, when the brake will be automatically applied to the other drum. Patents on this control have been applied for.

Nos. 2, 3 and 4 Driving Drums

Specifications

CONSIST of a pair of tandem friction drums, fitted with our special cone type friction and asbestos lined brakes. The drums are bronze bushed in all bearings where they run loose on the shaft.

On the Nos. 2 and 3 machines the main gears are cast iron spur gears with machine moulded teeth. Motor drive consists of a cast iron cut spur gear and cut steel pinion.

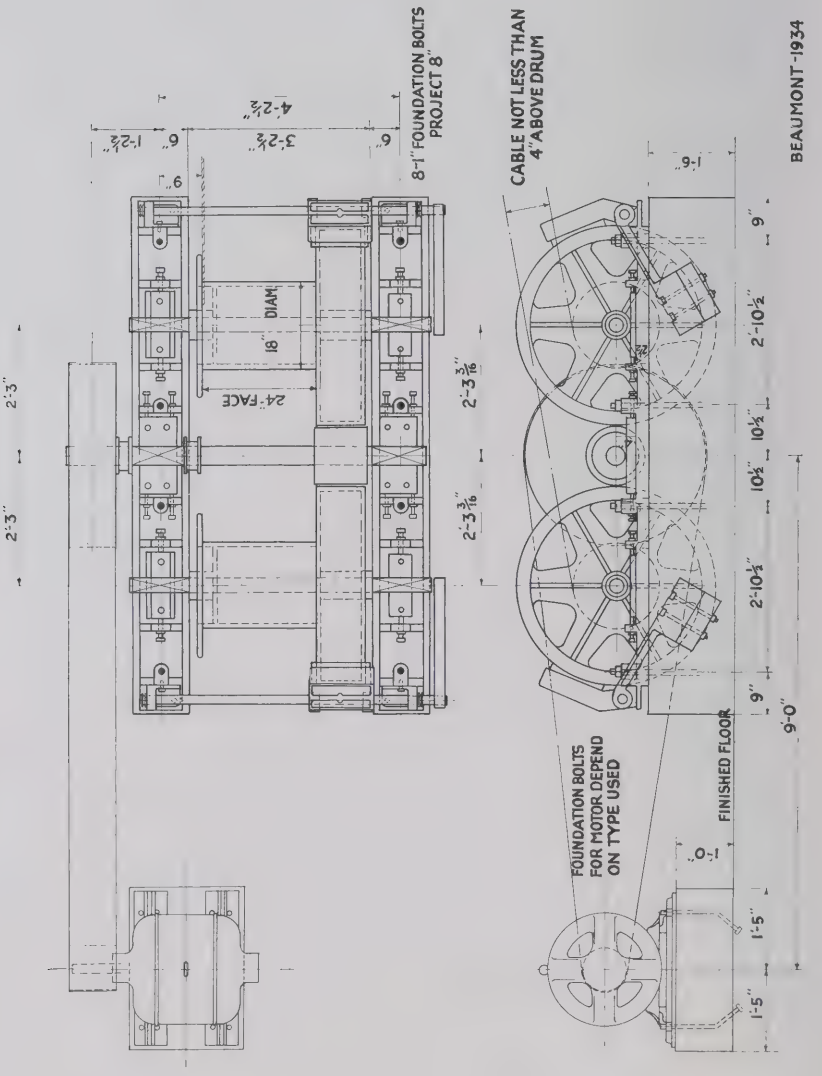
On the No. 4 machine all gears and pinions are cast steel with machine cut teeth. Gear guards of light steel plate are provided around all gears, on all machines.

Machine is mounted complete on a self-contained structural steel base, bolted to a concrete foundation, bolts being set when concrete is poured. Patent counterweighted band brakes are applied on each drum and are arranged to brake the free drum only, the brake on the winding drum being released. When machine is thrown into "neutral" brakes are automatically applied to both drums, instantly stopping the machine. This alternate releasing and applying of brakes and the throwing in and out of drums is accomplished by a hand wheel in the operator's cabin (patent applied for).

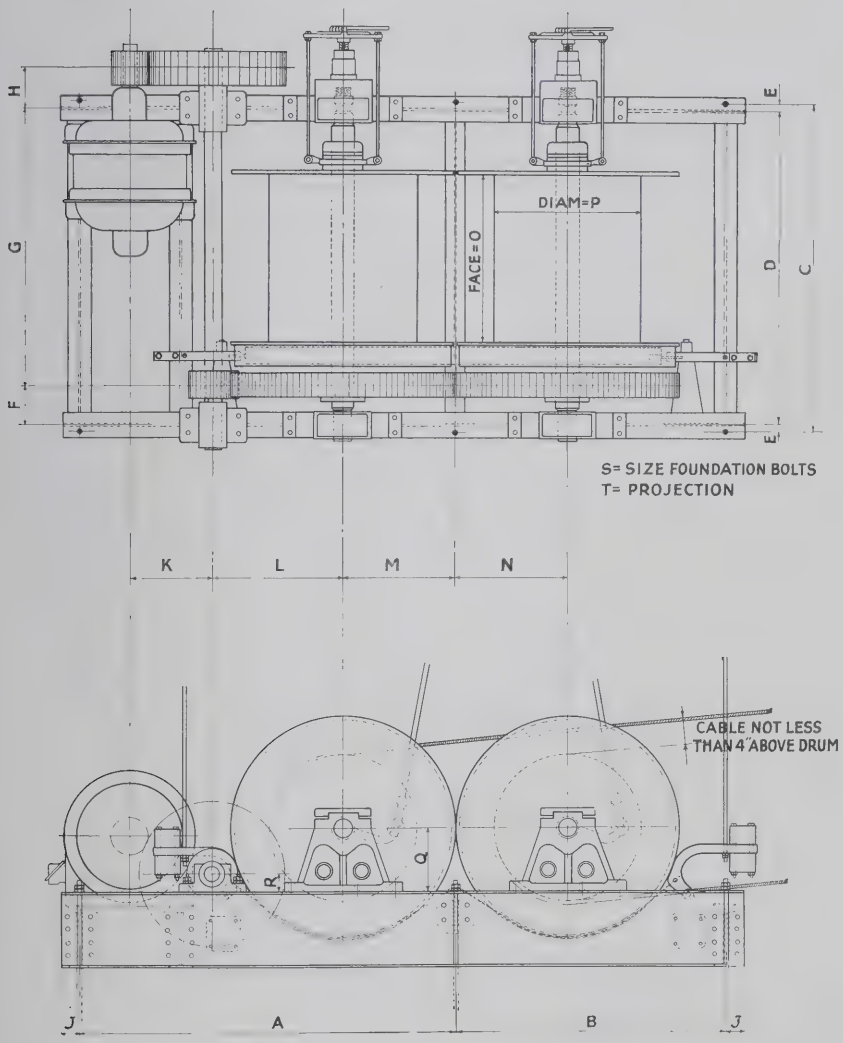
A push button control station is provided in the operator's cabin to throw out motor when desired.

Driving Drum	Size Drums	Diameter Drum Shafts Inches	Diameter Center Shaft Inches	Rope Pull Pounds
2	34″ dia. x 30″ face	$3\frac{5}{8}$	$2\frac{15}{16}$	3,000
3	$35\frac{1}{4}$″ dia. x 40″ face	$5\frac{3}{8}$	$3\frac{15}{16}$	6,000
4	40″ dia. x 42″ face	$5\frac{7}{8}$	$4\frac{15}{16}$	12,000

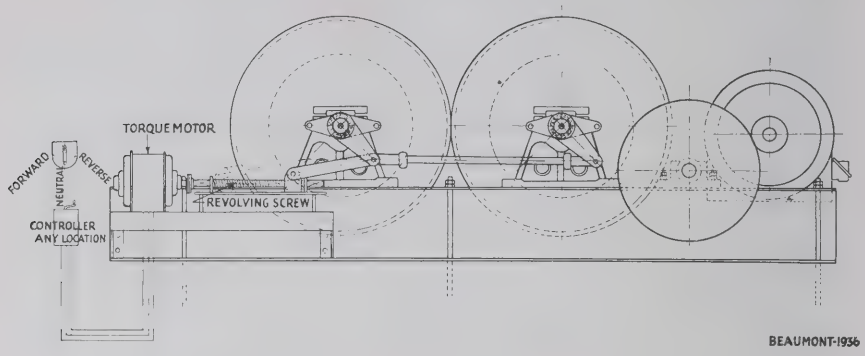
No. 1 Driving Drums



Nos. 2, 3 and 4 Driving Drums



SYSTEM	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T
2	6'-9 11/16"	5'-1 1/2"	5'-3 3/4"	5'-0"	1 7/8"	8 1/4"	4'-3 3/4"	6 1/2"	4"	1'-11 5/16"	2'-3 1/8"	1'-10 1/8"	1'-10 3/8"	30"	34"	9 1/2"	4 1/4"	1 1/8"	1'-9"
3	7'-5 7/16"	5'-4 1/2"	6'-0 1/2"	6'-3 1/2"	1 1/2"	9 3/8"	5'-6 1/8"	9 1/2"	4"	1'-7 11/16"	2'-7"	2'-2 3/4"	2'-2 3/4"	40"	35 1/4"	1'-3"	4 1/4"	1 1/8"	1'-9"
4	8'-3"	5'-11"	7'-10"	7'-6 1/2"	1 3/4"	10"	5'-10 1/2"	10"	4"	1'-8 1/2"	3'-0 1/4"	2'-5"	2'-5"	42"	40"	1'-5"	4 3/8"	1 1/4"	1'-11"



Driving Drums

Remote Control

(Patent applied for)

IT is not necessary for the drag scraper operator to be located immediately above the driving drums. If found desirable, the drums can be controlled from any point; this position must be such that the operator can clearly see the scraper at all times.

Remote control is accomplished by a reversing switch which controls a small operating motor. This motor is direct connected to a threaded shaft on which a nut travels back and forth. Connected to the nut is a lever which throws the drums in and out of engagement with their frictions. Throwing the reversing switch to one side causes the nut to travel backwards, throwing the rear drum into engagement and releasing the forward drum; by throwing the switch to the opposite side the rear drum is released and the front drum put into engagement. With the nut centered, the drums are in "neutral," neither drum revolving.

Specifications

Equipment will consist of a General Electric (or equal) drum controller with spring handle, a small torque motor, cold rolled steel threaded shaft and steel levers arranged as shown in diagram above. Wiring between motor and controller is provided by purchaser.

Cable and Fittings

CABLE is 6-strand, 19-wire plough steel haulage rope of the best obtainable quality. The cable leads from one drum to the front post sheaves, then out across the field to the tail blocks, then back again to the front post sheaves and to the other drum.

Every effort has been made to eliminate cable wear. The leads to the drums are always 1 in 50 and a larger ratio if possible to enable the cable to wind on the drum in even layers. This means the drums must be at least 50 feet from the front post sheaves.

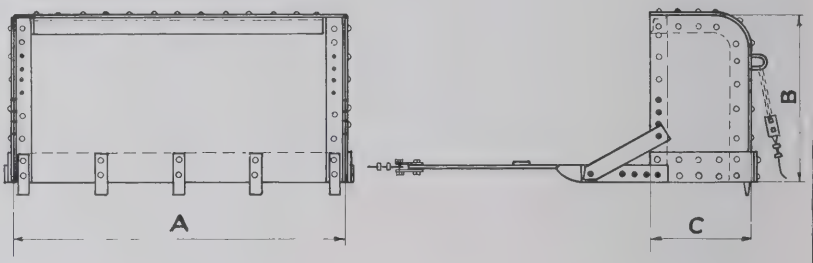
Our standard distance is 50 feet. The free cable should always be led across the field and not wound up on the drums; in other words, not over 50 feet of cable should be on the drum which is just ready to start pulling in the scraper and cable.

Attention to such details as these is what has made the Beaumont Cable Drag Scraper System so successful.

System	1-A	1-B	2-A	2-B	3-A	3-B	4-A	4-B
Cable	1/2″	1/2″	5/8″	5/8″	3/4″	3/4″	1″	1″

The Scraper

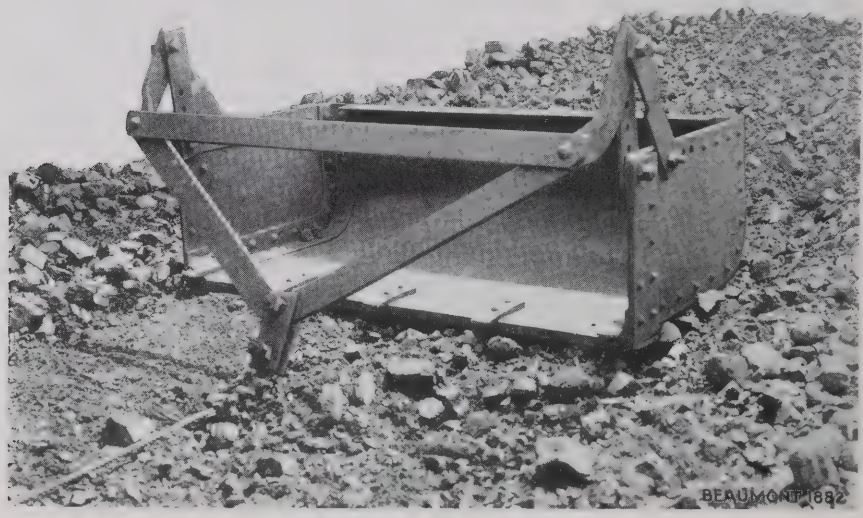
(Patent applied for)



SYSTEM	1	2	3	4
A	4'-8"	5'-10"	7'-0"	8'-10"
B	2'-4"	2'-11"	3'-6"	4'-5"
C	1'-5"	1'-9¼"	2'-2"	2'-8"
CAPACITY	1200#	2000#	4000#	8000#
PLATE	3/16"	3/16"	¼"	¼"

BEAUMONT 1937

SCRAPER is built of steel plate, substantially reinforced with flat irons. Scraper is attached to cable by special clamps, so that it may be easily reversed. The scraper has a rounded back, which offers the least resistance when returning empty over the coal pile. Sharpened tool steel teeth are provided along the digging edge of bucket to assist in loading the scraper. Hinged bale allows adjustment of the angle of scraper when storing or reclaiming coal.



Scraper Going Back for More Coal

The Beaumont Cable Drag Scraper

Scraper Storing Out

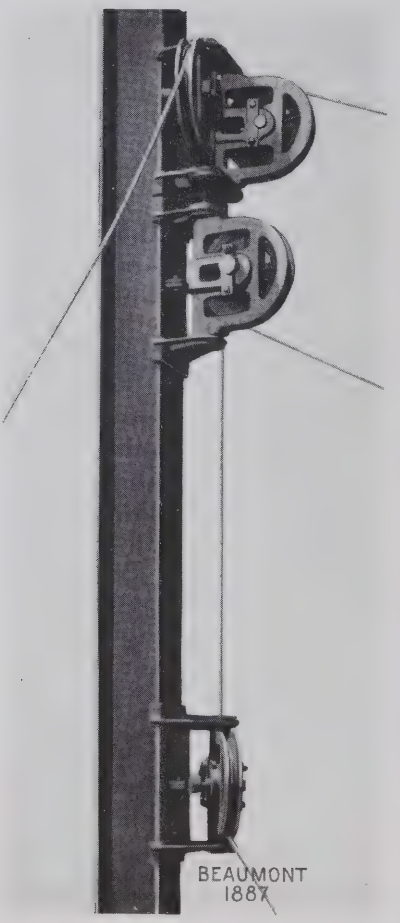
Returning Empty

Reclaiming Coal

Front Post Sheaves

Swiveled and Adjustable Vertically

(Patented)



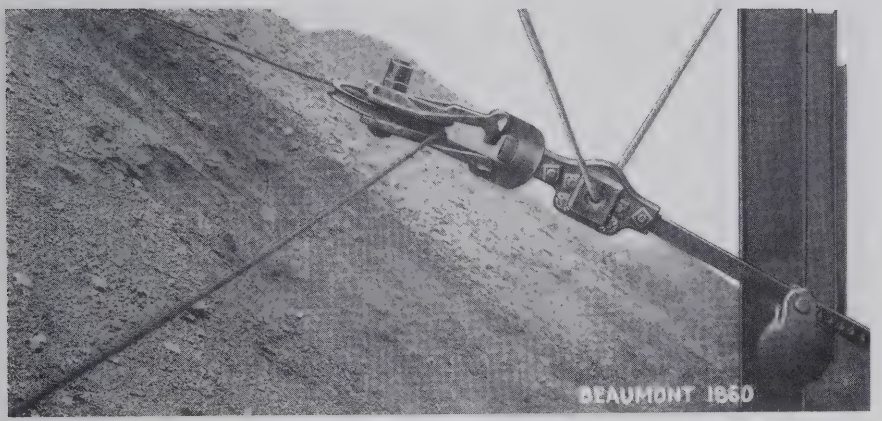
FRONT post sheaves are cast steel and are set in cast steel swivel housings. Sheaves are attached to the housings by steel pins fitted with thick brass bushings. Pins terminate in compression grease cups. The sheaves through which the cables lead to the drums are swivel, but are in fixed housings, bolted to the front post. The sheaves through which the cables lead to the field are arranged to move up and down the front post by a hand winch attached to the rear of the front post, three feet above the ground.

Sheave hoisting rope is led from winch over a sheave fixed in top of front post and down to movable front post sheaves.

When necessary to remove cable from sheaves, the pin is pulled out and the entire wheel is removed from its housing.

On account of the all-steel construction of these sheaves the wear is at a minimum. The earliest installations are today using the original front post sheaves after handling thousands of tons of coal.

System	1-A	1-B	2-A	2-B	3-A	3-B	4-A	4-B
Diameter, Sheave	17″		24″		30″		36″	



Tail Blocks

Swiveled and Balanced
(Patented)

THE blocks are both swiveled and hung in balance so that the sheave is free to allow the cable to lead off in any direction. Without this feature, the weight of the sheave, housing and lashing is supported by the haulage cable and causes undue wear on both the cable and sheave.

Sheave is cast steel revolving on a grease lubricated steel pin and mounted in a cast steel housing.

Blocks are attached to back post cables at any desired point by steel saddle castings.

When it becomes necessary to relocate the tail blocks this is readily accomplished by removing one bolt. By removing a second bolt the block and counterweight may be separated for greater ease in relocating.

System	1-A	1-B	2-A	2-B	3-A	3-B	4-A	4-B
Sheaves	12½″		17″		24″		24″	
Pins.	2″		2½″		3″		3″	

Front Posts

ARE hollow built-up steel sections, projecting sixteen feet above the ground. Posts are embedded in concrete at bottom of pit, and are filled with concrete by purchaser when building pit. Sizes are given in table below.

Back Posts

Are Bethlehem H-columns of size given in table below and projecting above the ground. They are set in concrete by the purchaser when the concrete is poured.

Concrete for back posts should be poured into a neat hole dug in the ground with post spade so that the earth will be firm enough to withstand cable pull.

Back posts must be set exactly twenty feet apart.

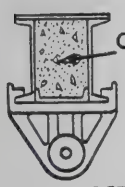
Back Post Cables

Two lengths of cables are provided to attach between the back posts between which the tail blocks hang. These cables are cast crucible steel with hemp center. Blocks are clamped to the cables.

System	1-A 1-B	2-A 2-B	3-A 3-B	4-A 4-B
Front Post . . .	10″ channels 1¼″ x 13″ plate	10″ channels ⅜″ x 15″ plate	12″ channels ½″ x 18″ plate	15″ channels ½″ x 22″ plate
Back Posts not over 7′ high above concrete	12″ H	14″ H With Top Tie Rods	14″ H With Top Tie Rods	12″ channels ½″ x 18″ plate
Back Posts not over 3′ high above concrete	8″ H	10″ H	12″ H	14″ H
Back Post Cable	⅝″	¾″	1″	1¼″

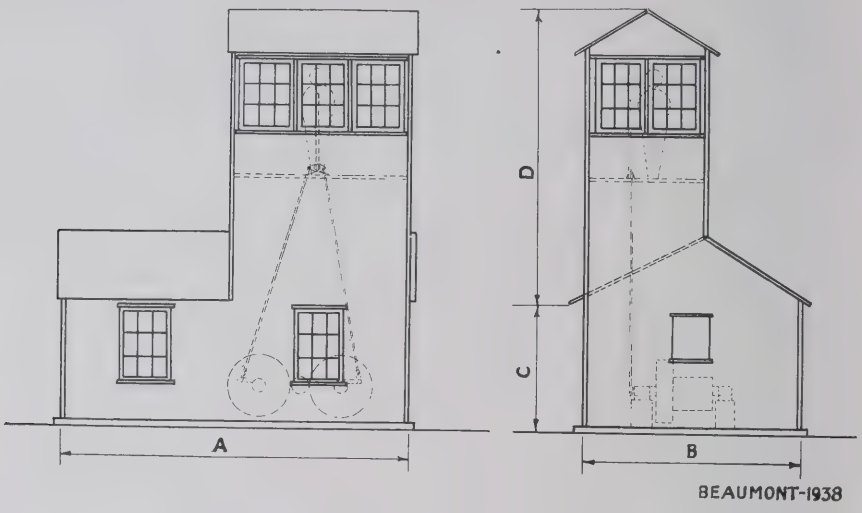
The Beaumont Cable Drag Scraper for Coal Storage

Size System	1A	1B	2A	2B	3A	3B	4A	4B
Capacity in Tons per Hour at 100 feet average haul	60	80	100	135	200	275	400	550
Pounds of Coal in Scraper	1200	1200	2000	2000	4000	4000	8000	8000
Speed	350	470	350	470	350	470	350	470
Horsepower	25	30	40	50	75	100	150	200
Cable Pull	1800 lbs.	1800 lbs.	3000 lbs.	3000 lbs.	6000 lbs.	6000 lbs.	12,000 lbs.	12,000 lbs.
Size Cable (Blue Center Improved Plough Steel, 6 Strand, 19 Wire)	½″	½″	⅝″	⅝″	¾″	¾″	1″	1″
Tail Blocks	12½″	12½″	16″	16″	24″	24″	24″	24″
Front Post Sheaves	17″	17″	24″	24″	30″	30″	36″	36″
Driving Drums	No. 1	No. 1	No. 2	No. 2	No. 3	No. 3	No. 4	No. 4
Front Post	10″[s ¼″x 15″ pl.	10″[s ¼″x 15″ pl.	10″[s ⅜″x 15″ pl.	10″[s ⅜″x 15″ pl.	12″[s ½″x 18″ pl.	12″[s ½″x 18″ pl.	15″[s ½″x 22″ pl.	15″[s ½″x 22″ pl.
Back Posts not over 7 feet 0 inch high abv. concrete	12″-H	12″-H	14″-H With	14″-H top tie	14″-H rods	14″-H	12″[s ½″x 18″ pl.	12″[s ½″x 18″ pl.
Back Posts not over 3 feet 0 inch high abv. concrete	8″-H	8″-H	10″-H No	10″-H top tie	12″-H rods	12″-H	14″-H	14″-H
Back Post Cable	⅝″	⅝″	¾″	¾″	1″	1″	1¼″	1¼″



FRONT POST THUS.

Note that machines of same number are identical except for speed of the scraper and horsepower of motor. The greater speed of the scraper in machines with suffix B gives an increased coal handling capacity. The pull on the cable is always the same for the same size scraper regardless of the speed of the scraper.



Machinery House and Operator's Cabin

MAY be made of either wood or steel with sheathing. We recommend wooden construction where building laws permit on account of the greater warmth of this structure.

It must be remembered that the operator has little physical exertion to keep himself warm.

The house is the size shown above, giving ample clearance all around the driving drums.

The operator's cabin is above the winding drums and is entered by means of a ladder from the machinery house floor.

Size System	1	2	3	4
A	18′ 6″	17′ 0″	17′ 0″	18′ 0″
B	11′ 6″	12′ 6″	12′ 6″	13′ 6″
C	6′ 10″	8′ 6″	8′ 6″	8′ 6″
D	15′ 2″	14′ 6″	14′ 6″	14′ 6″

Machinery House and Operator's Cabin

Specifications

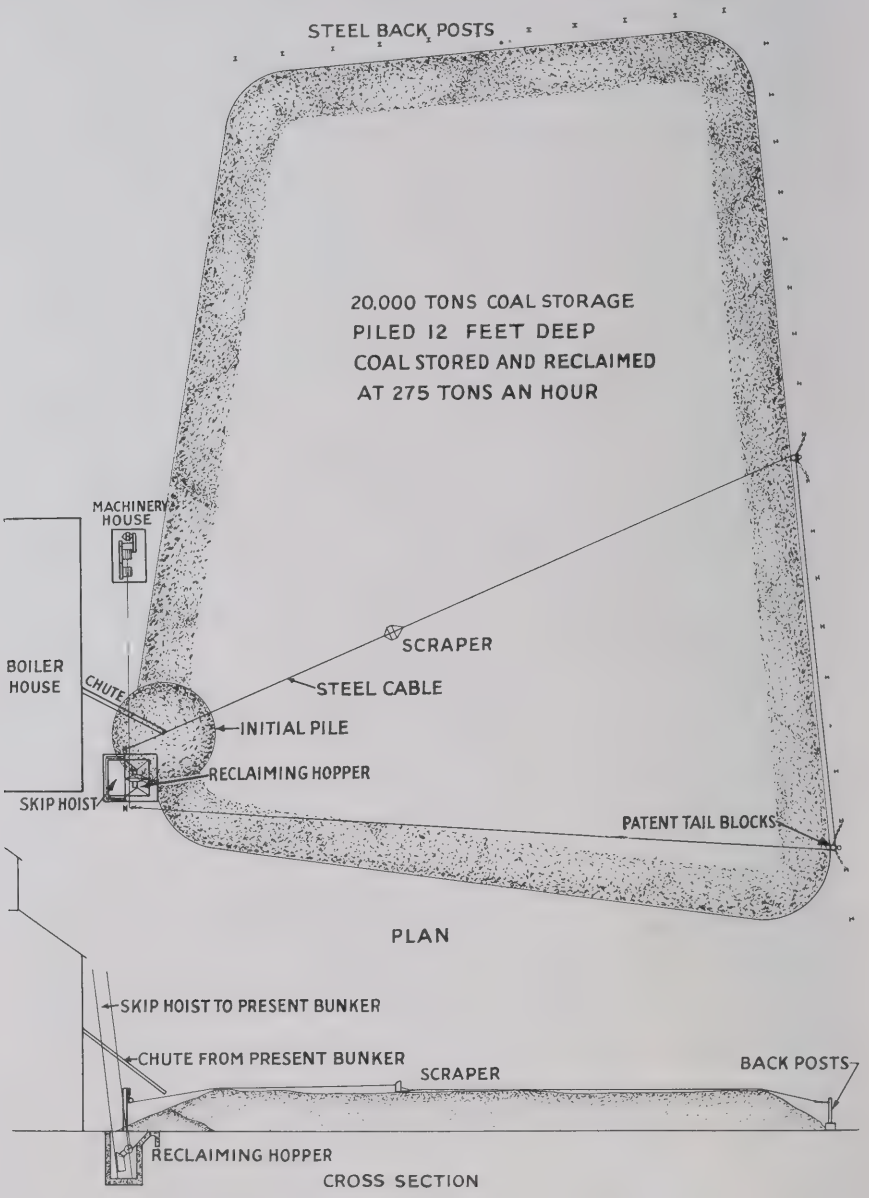
Wood Machinery House. Will consist of a wood frame house built up on concrete sills and covered with a composition roof. Ample wood sash are provided for light and ventilation, also a wood door for access to house. Floor is cement and is built by concrete contractor. The operator's cabin is above the machinery house. It is provided with a plank floor and trap-door for entrance. Grating in this floor is provided to allow operator to see drums while working. Woodwork will receive two coats of paint.

Lever for operating drums is conveniently arranged in the cabin.

Steel Machinery House. Will consist of a steel frame house sheathed with corrugated steel, No. 22 gage on roofs and No. 24 gage siding.

Other details are as specified for wood machinery house above.

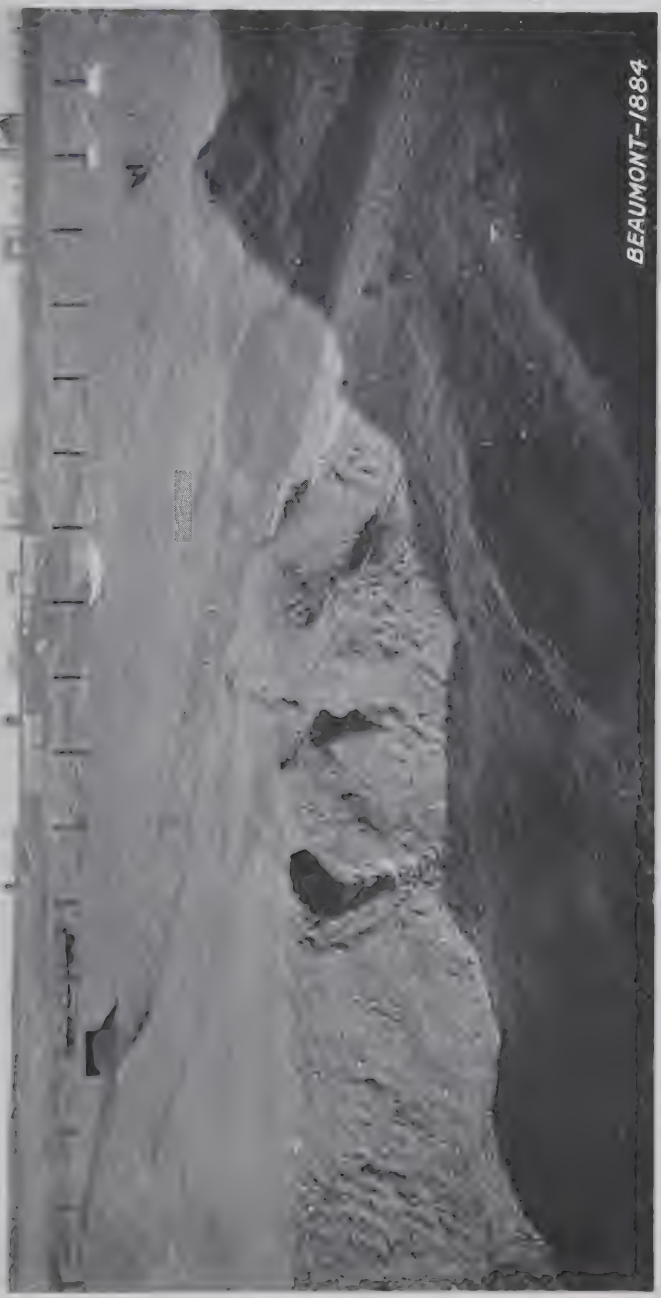
The Beaumont Cable Drag Scraper



PUBLIC SERVICE ELECTRIC CO., Perth Amboy, N. J.

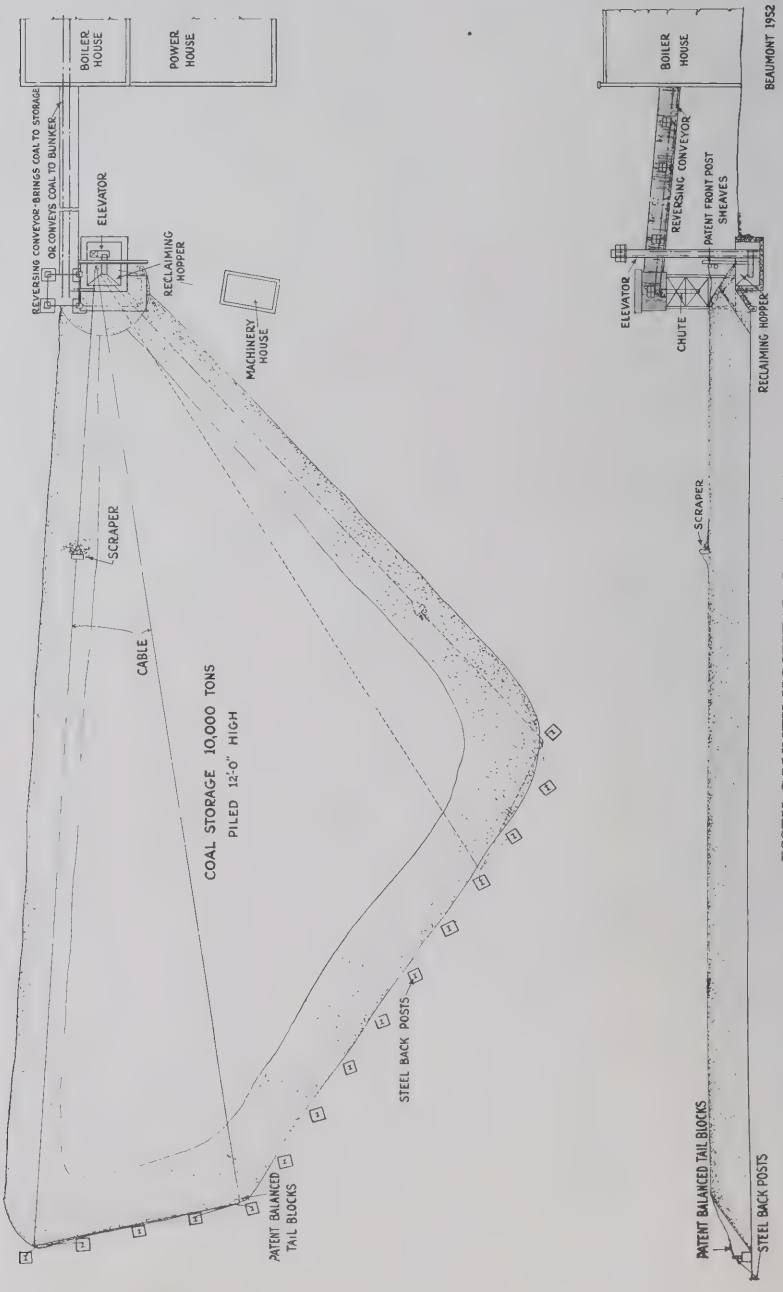
Storing and reclaiming 20,000 tons of coal at 275 tons per hour with No. 3-B Beaumont Cable Drag Scraper System.

The Beaumont Cable Drag Scraper



PUBLIC SERVICE ELECTRIC CO.
Perth Amboy, N.J.

The Beaumont Cable Drag Scraper



ESSEX COUNTY HOSPITAL, Overbrook, N. J.
No. 1-B System

The Beaumont Cable Drag Scraper

ESSEX COUNTY HOSPITAL
Overbrook, N.J.

The Beaumont Cable Drag Scraper

The Beaumont Cable Drag Scraper

SOLAR REFINING CO., Lima, Ohio

The Beaumont Cable Drag Scraper

AT THE WILMINGTON AND PHILADELPHIA TRACTION COMPANY'S POWER HOUSE

We installed, ten years ago, a complete coal and ashes handling system, to handle coal from cars to the bunker. We have since added a No. 1-A drag scraper system and a new ashes skip hoist. The cut above shows clearly how the drag scraper can be applied to existing plants even though the situation is complicated.

The Beaumont Cable Drag Scraper

ABOVE, general view of complete system, with back posts in the foreground, buried under coal. The back posts are 12 feet high, but coal is stored here 25 feet deep.

To the left, view of machinery house and V-bucket elevator. Built of wood during the war, when it was almost impossible to obtain steel.

WILMINGTON AND PHILADELPHIA TRACTION COMPANY
Wilmington, Del.

The Beaumont Cable Drag Scraper

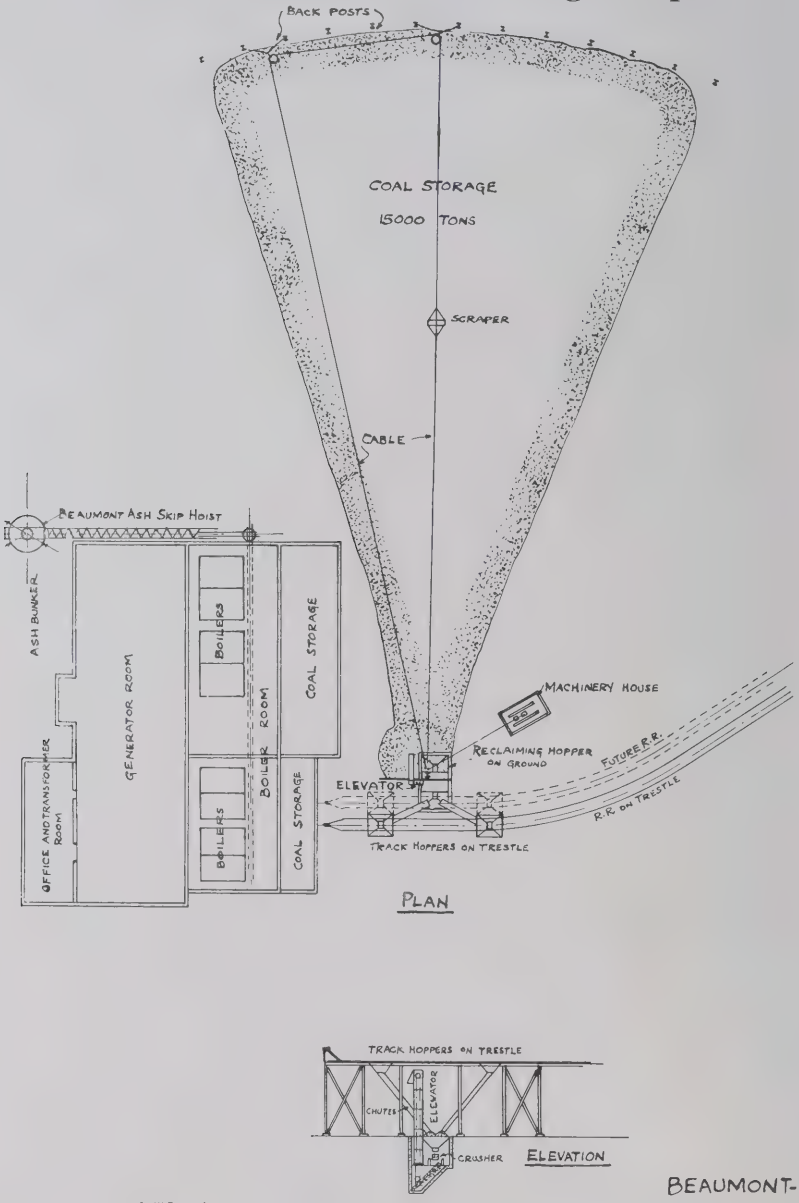
H. W. JOHNS-MANVILLE CO., Manville, N. J.

Complete coal and ashes handling installation, with No. 1-A drag scraper used for ground storage. Ashes are handled by an automatic skip hoist, the ashes being collected from ash pits by a push car running in a tunnel under the boilers.

The Beaumont Cable Drag Scraper

General View of Drag Scraper System at Johns-Manville Plant

The Beaumont Cable Drag Scraper



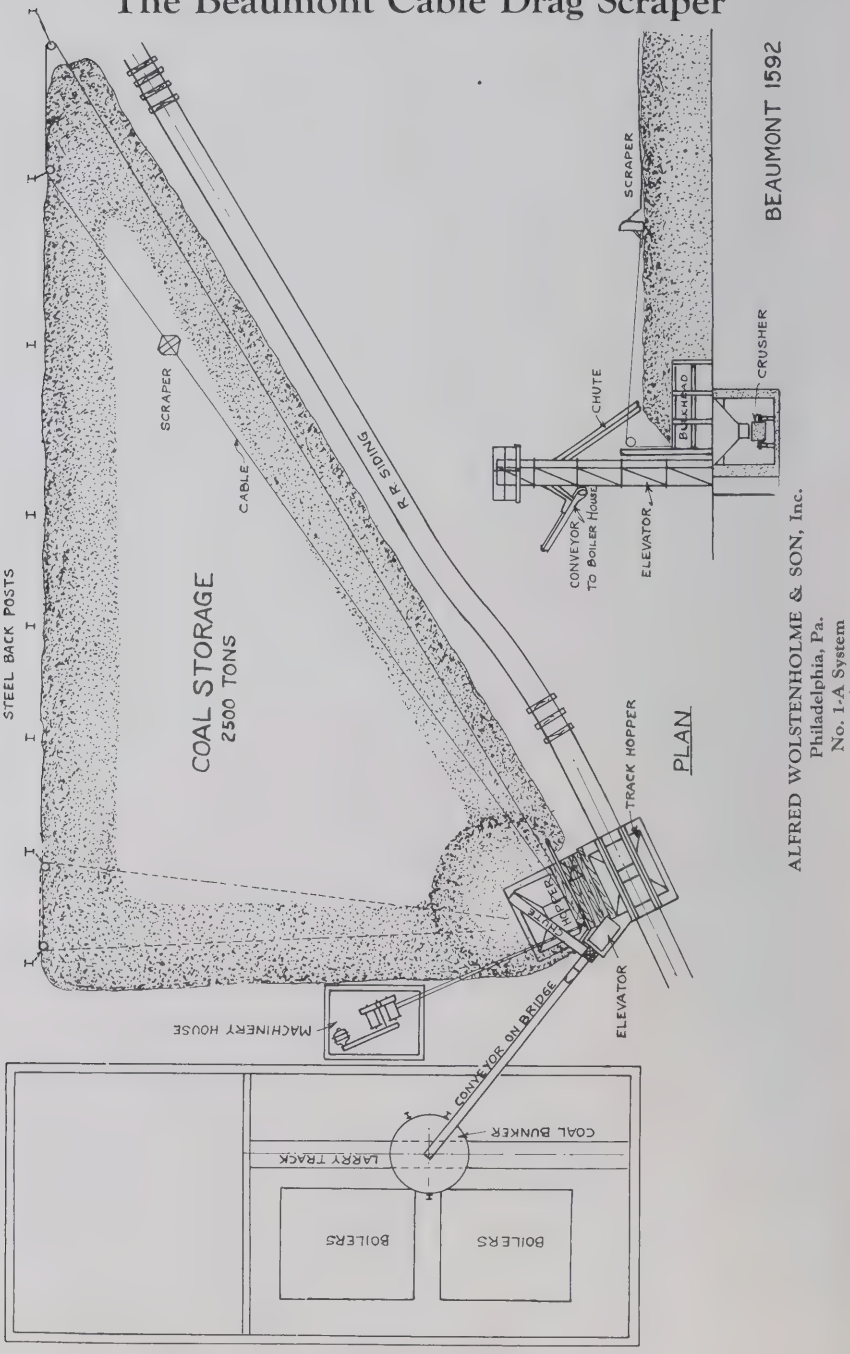
MUNICIPAL ELECTRIC LIGHTING AND POWER PLANT
City of Richmond, Ind.

No. 1-A cable drag scraper system for coal storage and Beaumont Skip Hoist for ashes.

The Beaumont Cable Drag Scraper

MUNICIPAL LIGHT AND POWER PLANT
Richmond, Ind.

The Beaumont Cable Drag Scraper

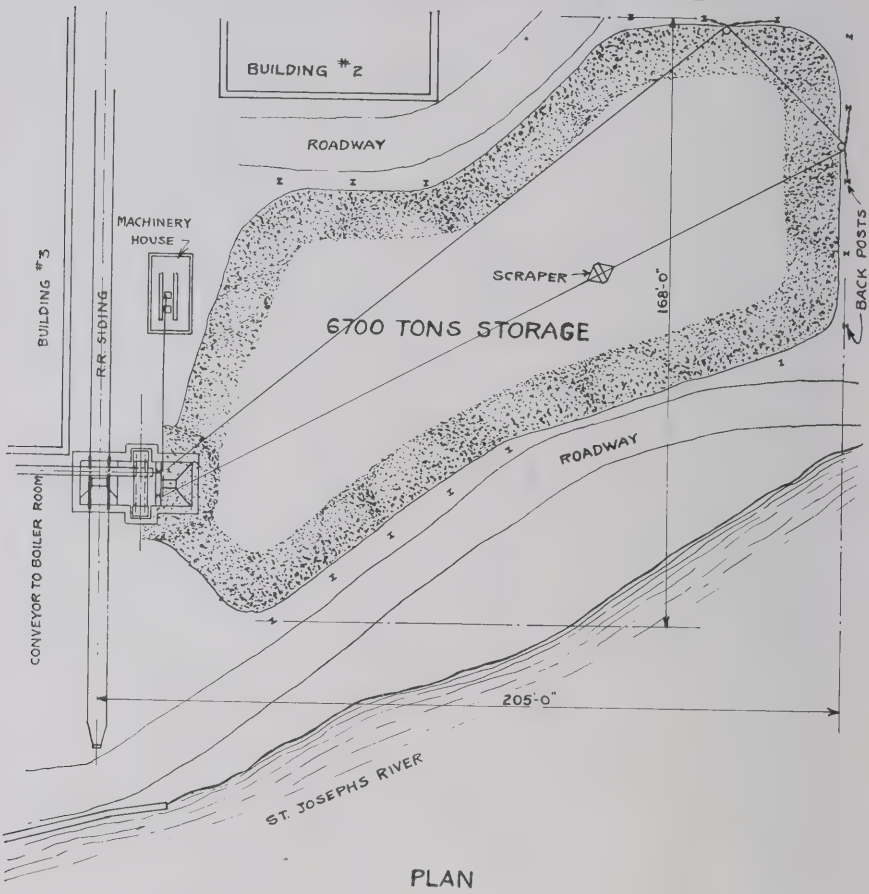


ALFRED WOLSTENHOLME & SON, Inc.
Philadelphia, Pa.
No. 1-A System

The Beaumont Cable Drag Scraper

ALFRED WOLSTENHOLME & SON, Inc.
Philadelphia

The Beaumont Cable Drag Scraper



MISHAWAKA WOOLEN MANUFACTURING CO.
Mishawaka, Ind.

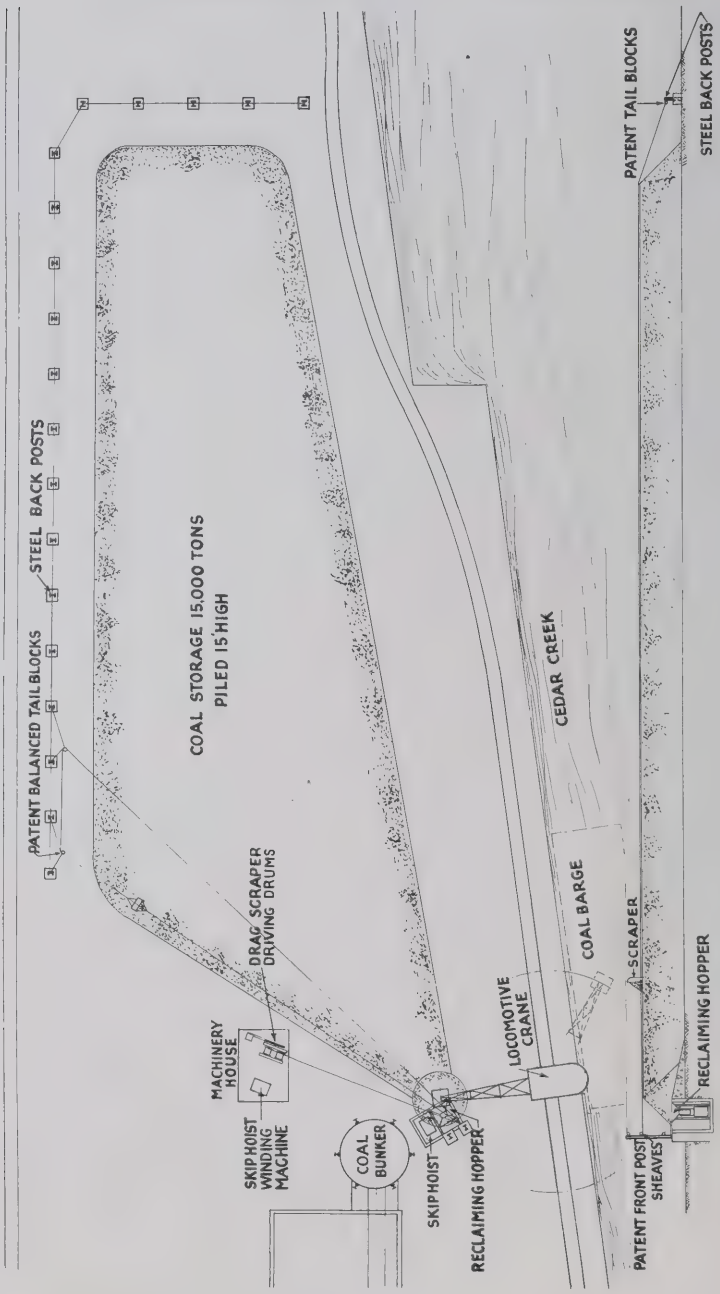
Run-of-Mine Coal Handled—No. 1-A System

THIS company found it more satisfactory and economical to install the Beaumont Cable Drag Scraper System for their coal storage. They inspected war plant surplus conveying equipment with intentions of installing conveyors for their storage. They are convinced that the drag scraper is the best system for their plant.

The Beaumont Cable Drag Scraper

MISHAWAKA WOOLEN MANUFACTURING CO.
Mishawaka, Ind.

The Beaumont Cable Drag Scraper

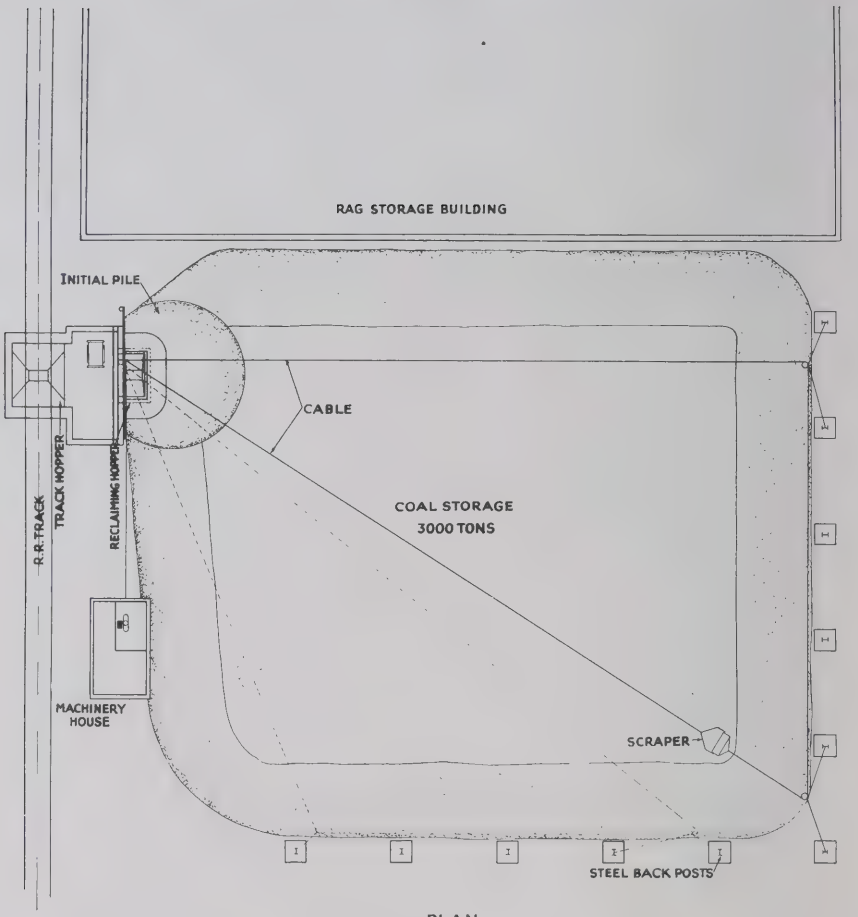


CRANE CO., Bridgeport, Conn.
No. 1-B System

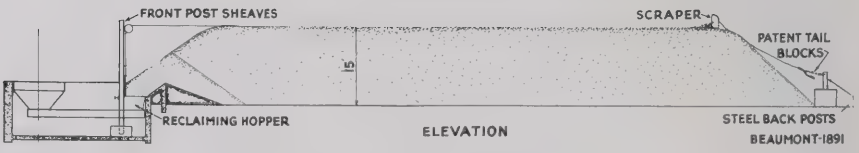
The Beaumont Cable Drag Scraper

CRANE CO., Bridgeport, Conn.

The Beaumont Cable Drag Scraper



PLAN



J. SPAULDING & SONS CO.
N. Tonawanda, N. Y.
No. 1-A System

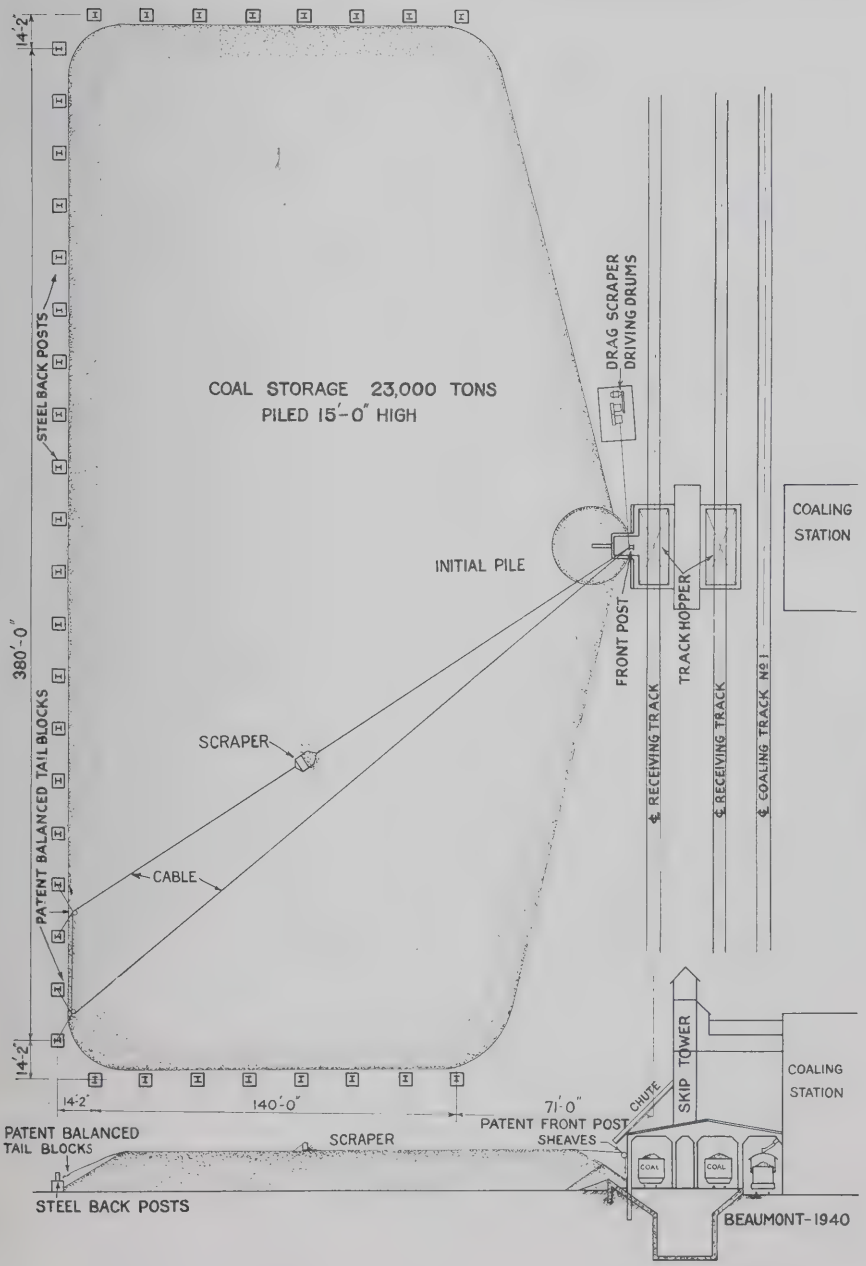
The Beaumont Cable Drag Scraper

CHERRY RIVER PAPER CO.
Richwood, W. Va.
No. 1-A System

The Beaumont Cable Drag Scraper

KEASBEY & MATTISON CO.
Ambler, Pa.
No. 1-A System

The Beaumont Cable Drag Scraper



RICHMOND, FREDERICKSBURG & POTOMAC RAILROAD, Richmond, Va.
No. 2-B System

Operator at Lever

THIS unskilled laborer will handle from 60 to 600 tons an hour single handed.

Any idle man around the plant can store or reclaim your coal when necessary. An expensive, licensed or skilled operator is not required.

Section 4—BUNKERS—CRUSHERS—GATES

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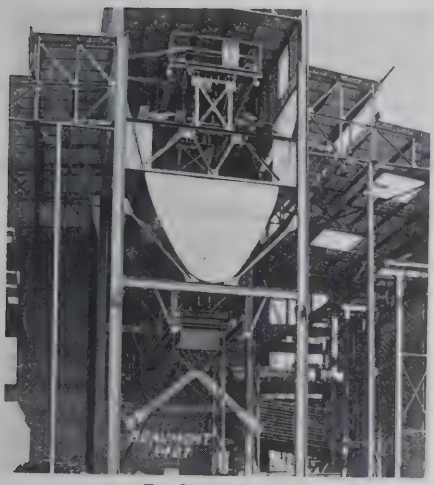
Beaumont Suspended Steel Coal Bunkers



Bunker and Larry
PHILA. SUBURBAN GAS AND ELEC. CO.
Cromby, Pa.

Bunker and Larry
NATIONAL FOLDING BOX CO.
New Haven, Conn.

Bunker and Larry
MILTON MANUFACTURING CO.
Milton, Pa.

Bunker and Larry
AMERICAN OPTICAL CO.
Southbridge, Mass.

Note the Larries for delivering coal to the stokers, and the absence of an unsightly collection of gate-operating chains

Beaumont Suspended Steel Coal Bunkers

AN overhead coal bunker assures a continuous supply of coal to the boilers. The capacity depends on the number of days the supply is likely to be interrupted. If a very large capacity is desired it is more economical to store the bulk of the coal on the ground by means of a Cable Drag Scraper. The bunker can be inside the boiler house, or outside. Ground storage should be in reserve and not active.

Types of Bunkers

There are but three basic types to be considered: steel, concrete or a combination of both. Wood bunkers are seldom built and then only for temporary installations. Rot and fire risk are sufficient reasons for eliminating them.

Steel bunkers may be divided into two general types: rigid and suspension. The rigid type is designed as a wall, which must be braced by rolled sections, while the suspension bunker consists only of plates suspended to form a loop and therefore has to resist tensile stresses only. The latter is the most economical.

If we build the usual form of steel bunker with stiffened side plates (rigid type), we must put a series of hoppers along the full length of the bunker, the outlets being say 15 to 20 feet apart. Thus the plates at the outlets are subject to the abrasion from the entire coal contained in this section. This is not of serious consequence to the plates directly, *but it scrubs off the protective coating* upon which we are relying to resist corrosion, and when that is gone, the plates are subject to the disastrous chemical action of the ever-present sulphuric acid.

The suspension bunker eliminates this, for the radius to which the bottom plates are rolled allows a small portion of the coal to remain "dead." The outlet gates are spaced closer together to minimize this dead coal, and consequently there are three or four gates in our 20-foot section instead of one, with one-third to one-fourth the abrasion, *which is coal on coal, not coal on the steel plates.* The protective coating is therefore kept intact, and the life of the bunker may be said to be as long as any other piece of steel entering into the construction of the boiler house.

Some engineers resort to lining the bunker with concrete, this being put on as plaster. This may be effective in rigid bunkers, but the suspension type "breathes," the movement varying with the load, occurring when load changes. This action causes cracking of the lining and then the sulphuric acid gets to work with deadly effect. This cracking of the concrete is the principal objection to suspended concrete bunkers, where the steel reinforcing is merely a light sheet of corrugated plate. In suspension steel bunkers the concrete lining is unnecessary and should be omitted. In rigid types many engineers consider it necessary, thus adding to the cost which is higher than the suspension type, even without lining.

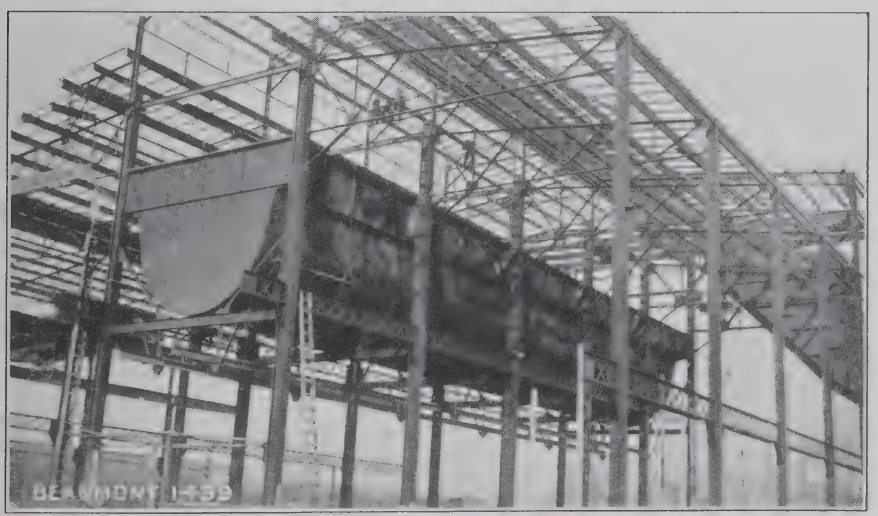
Concrete bunkers are usually built external to the boiler house, at one end of the firing aisle. Internal type concrete bunkers do not fit in well with a boiler house where the building is the usual steel frame and brick wall construction. A concrete bunker will not fail through fire or rot, but it can fail through corrosion of the reinforcing, unless the steel is of large section.

The combination steel and concrete bunker consists of a skeleton steel framework, with reinforced concrete slabs taking the place of the steel plates. This type is necessarily rigid, the bottom forming a V, the walls being supported by the same girders which support the bottom.

These types of bunkers are much more expensive than steel plate bunkers, and the extra cost cannot be justified.

The advantages of the suspended steel bunker are so manifest that we strongly advocate its use. The shape we have adopted is the result of many years of experience in designing and installing them. We therefore urge our customers to adhere to this shape, which gives the best combination of all the elements which have to be considered.

When the suspended steel bunker is used for anthracite coal, it is considered advisable to protect the plates with Bitumastic Enamel, applied hot. This protects the plates against the extreme acidity of this coal, and the enamel will not scrub off, due to the shape of the bunker. A bunker protected this way will have a life as long as the building itself, regardless of the extreme acidity of the coal.



Beaumont Suspension Bunker
CITIZENS GAS AND ELECTRIC CO.
Waterloo, Iowa

Advantages of Beaumont Suspended Steel Coal Bunkers

1. **Long Life.** The oldest known steel plate suspended bunkers are one built in 1900 and another built in 1903. Both are storing bituminous coal and are in good condition today.

2. **Bottom Curve Increases Life.** It is known that coal flowing through a chute or over any surface of metal will wear through a ¼-inch steel plate in a year or two. This action is entirely different from that which exists inside of a suspension bunker; the material does not slide on the bottom plate. The reason for this is, when a gate is opened in the bottom of the bunker, only that material vertically above the gate flows out and the vertical column of material vertically above the gate moves downward, causing a depression to appear on the top surface of material. This depression becomes deeper and the material begins to slide down or cave into this funnel-shaped depression. That portion of the material which lies against the sides of the bunker rolls away from the sides, down the incline and into this cavity. It is evident, therefore, that those particles of the material laying against the bottom roll downward into the cavity and do not slide down along the inclined surface.

It is true that coal will corrode the inside surface of a steel bunker, but if the material does not slide over this rusty surface and scrub the rust away then no further corrosion occurs. In the case of a chute, where the material slides directly on the metal surface, rapid wear occurs because a fresh, clean surface is constantly exposed to the corrosive action of the material and the oxide which is formed is being constantly removed and a fresh surface prepared for further corrosion.

To illustrate: If acid is poured on a steel plate, corrosion will immediately occur, but the oxide formed will neutralize the acid and further corrosion will not occur unless the protective coat of oxide is removed. The sliding action of coal performs this removal of oxide, which continually presents a clean surface for further corrosion. Under such conditions the life of the plate is short, but in a Beaumont Suspended Steel Bunker such removal of oxide does not occur, therefore the oxide remains as a protective coat and the bunker bottoms do not wear out.

3. Easily Relocated. It is sometimes impossible to build or design today for conditions which we run into five or ten years hence. A steel bunker can be moved from one point to another or it can be raised, lowered or scrapped. Several Beaumont Bunkers have been relocated to our knowledge.

A concrete bunker is practically built of stone and cannot be relocated. It is not safe to build any part of a manufacturing plant in a manner in which it cannot be enlarged or moved to meet possible future conditions.

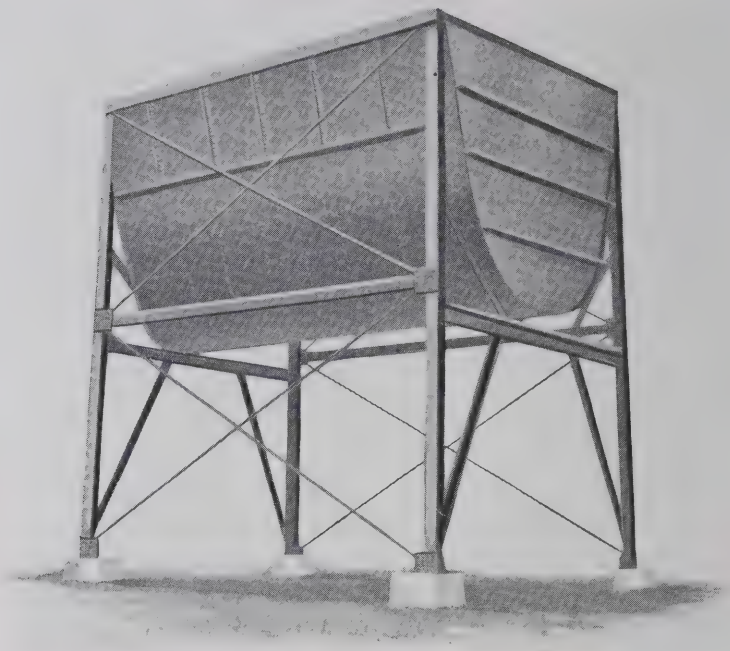
4. Less Costly Foundations. A steel suspension bunker is the lightest weight bunker for an equal amount of storage capacity. It will therefore require less costly foundations than any other type of bunker.

5. Construction Expedited. The time required to install a Beaumont Steel Suspension Bunker is less than any other type bunker.

6. Deflects with Varying Load. The steel suspension bunker will assume a shape in conformity with the amount of coal in it. The plates deflect under heavy load and rise as the load is lessened. With a suspended concrete or concrete lined suspended bunker this movement would soon crack the concrete permitting the acid water from the coal to attack the reinforcing metal.

7. Lowest First Cost. On account of its simplicity, the cost of a Beaumont Steel Suspension Bunker is less than any other type for an equal amount of storage. On account of the greater ease of construction the cost is further reduced.

8. Lining for High Sulphur Coals. Bitumastic Enamel, a tough, pliable coating, is applied to the inside of bunkers for storing anthracite coal or high sulphur bituminous coals. This protects the plates against the extreme acidity of this coal and the enamel will not scrub off, due to the shape of the bunker. This increases further the life of these bunkers.



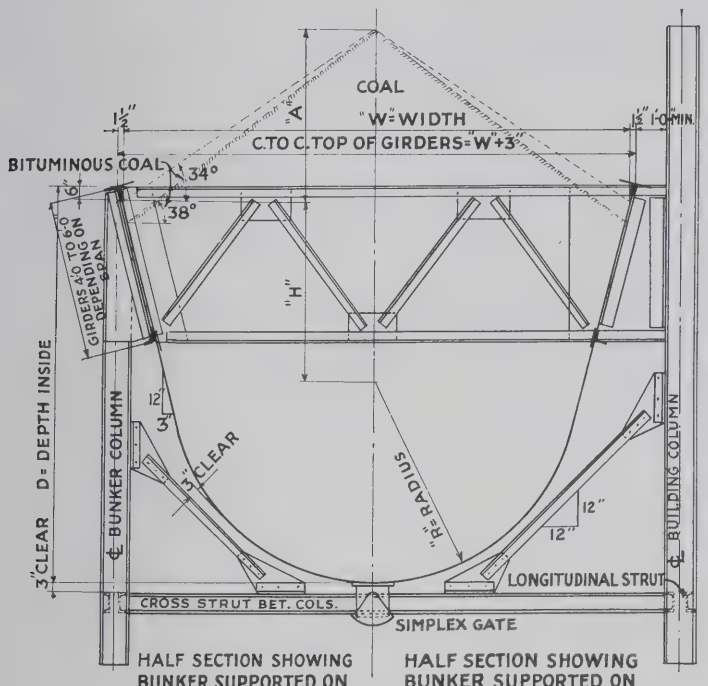
Beaumont Suspended Steel Coal Bunkers

Specifications

BUNKER is of the steel plate suspended type, as shown above. In designing these bunkers the angle of repose is assumed to be 35 degrees and weight of coal 50 pounds per cubic foot. Columns and girders are designed according to specifications recommended in the Carnegie Pocket Companion. Bottom plates will be ¼-inch thick; all bunker steel work will be field riveted.

Bitumastic Bunker Lining (for bunkers storing anthracite or other acid-bearing coals). The bunker will be protected on the inside from corrosion due to the acidity of coal by means of two applications of protective coating. The first coating, which is Bitumastic Solution, is applied cold; the second coating, which is Bitumastic Enamel, is applied hot. This lining will protect the bunker from any possible effect of sulphuric acid in the coal. Bunkers of this type, ¼ inch thick, are in use in Philadelphia after twenty years' service.

The edges of the gate openings, the only place that the Bitumastic might wear off, are reinforced with flat irons, which are given an additional coating of the Bitumastic Solution.



BEAUMONT 1815

Beaumont Suspended Steel Coal Bunkers

Tons per Ft. Continuous Loading	Tons per Ft. Loaded Every 8' 0"	W	R	H	D	A	*Tons Lost in 2 Ends
1.85	1.60	10	4' 0"	3' 6"	8' 0"	3' 4⅝"	.8
2.15	1.90	11	4' 4 13/16"	3' 10 3/16"	8' 9"	3' 8⅝"	1.0
2.55	2.30	12	4' 9⅛"	4' 2⅜"	9' 6"	4' 0¾"	1.5
3.00	2.75	13	5' 2⅜"	4' 6⅝"	10' 3"	4' 4¾"	2.2
3.50	3.25	14	5' 7 3/16"	4' 10 13/16"	11' 0"	4' 8⅞"	3.2
4.00	3.75	15	6' 0"	5' 3"	11' 9"	5' 0⅞"	4.5
4.55	4.30	16	6' 4 13/16"	5' 7 3/16"	12' 6"	5' 5"	6.1
5.15	4.90	17	6' 9⅝"	5' 11 3/16"	13' 3"	5' 9"	7.8
5.75	5.50	18	7' 2⅜"	6' 3⅝"	14' 0"	6' 1⅛"	10.0
6.45	6.20	19	7' 7 3/16"	6' 7 13/16"	14' 9"	6' 5⅛"	12.2
7.10	6.85	20	8' 0"	7' 0"	15' 6"	6' 9¼"	14.7
7.85	7.60	21	On account of severe internal stresses all bunkers over 20 feet wide must be specially designed.				17.5
8.55	8.30	22					20.5
9.40	9.10	23					24.6
10.30	10.00	24					29.0
11.25	10.90	25					34.0
16.00	15.60	30					58.0
21.75	21.30	35					88.0

Capacity is based on 38-degree angle of repose and weight of coal at 50 pounds per cubic foot or 40 cubic feet per ton. Last column of table gives deduction due to fact that bunker cannot be fully surcharged for entire length. On wide bunkers end sections may be built higher to prevent this loss.

*Due to lack of continuity of surcharge.

Beaumont Circular Steel Bunkers

For Coal and Ashes

Specifications

BUNKER will consist of a ¼-inch plate steel cylinder with a 45 degree plate steel cone bottom and a 45 degree No. 12 U. S. gauge steel plate cone top having an opening at top. The supporting structure will consist of four columns, braced in all directions and designed according to the specifications recommended in the Carnegie Pocket Companion. Gate is attached to a cone casting bolted to bottom cone of bunker.

Bunker and supporting steel will be riveted, excepting top cone of bunker, which will be bolted.

Beaumont Circular Steel Bunkers

Types of Lining

FOR the storage of ashes and high sulphur bearing coals some engineers prefer a lining in circular bunkers.

Any one of the three linings below is recommended, depending upon the service intended.

Cement Plaster Lining

Consists of a 1½-inch thick cement plaster laid on triangle mesh steel netting. This reinforcing is bolted to the bunker every 24 inches. Bottom cone and cylinder are lined.

Brick Lining

Consists of a layer of hard-burned red brick laid on edge (4 inches thick) in cement mortar. Steel ties are used to bond the brickwork to the bunker. Bottom cone and cylinder are lined.

Bitumastic and Tile Lining

Consists, first, of two applications of a protective coating. The first coating, which is Bitumastic Solution, is applied cold, the second coating, which is Bitumastic Enamel, is applied hot. On top of this lining, 1-inch tile is laid in cement mortar. Suitable steel ties are used to bond the tile to the bunker. Bottom cone and cylinder are lined.

The Beaumont Double Roll Coal Crusher

THIS crusher is especially designed for severe crushing service, to crush with minimum fines, consuming the least possible amount of power.

Proof that the double roll coal crusher produces minimum fine coal is evidenced by the fact that it is the only type used in the anthracite field. Fine coal to the anthracite operators is a dead loss, hence double roll coal crushers are used exclusively.

Fundamentally a double roll crusher is two wheels revolving toward each other at the same rate of speed, which means that coal will be drawn into the mesh of the rolls and carried through. There is no tearing or regrinding action on the coal as with a single roll crusher, where one roll grinds against a stationary plate.

The minimum diameter of rolls practical in a double roll crusher is definitely fixed by the size of the lumps to be crushed. For reducing mine-run coal, two 28-inch diameter rolls are required to "bite" the lumps and draw them into the rolls. Smaller rolls will not grip the large lumps.

Wear on the crusher rolls is evenly distributed over the perimeter of the rolls because both rolls travel at the same rate of speed. With a single roll crusher this wear is concentrated at the lower end or exit.

Wear across the face of the rolls is evenly distributed by the reciprocating feeder which spreads the coal in an even layer of uniform thickness over the entire face of the roll. This permits the fine material to drop through without injury and utilizes the full face of the crusher for crushing.

We recommend, and always use, a feeder to deliver coal to the crusher. The feeder not only delivers coal uniformly to the crusher but also cuts down power consumption.

Beaumont Double Roll Crushers are built with one shaft mounted in rigid bearings and the other in spring relief bearings, which avoids injury to the crusher in case any foreign hard substance falls between rolls. A safety shearing pin is provided on all crusher motor drives to release motor in case any foreign hard substance jams in the rolls.

Six sizes of crushers are built to crush coal from run-of-mine size to 2 inches at 30 to 350 tons per hour.

Beaumont Double Roll Coal Crusher

FROM the following table the most desirable size crusher for the purpose intended may be selected:

Non-Adjustable Coal Crushers

Number	Size	Rolls	Capacity, Tons per Hour
1	28 x 30	Cast Iron, Chilled	30 to 75
2*	30 x 30	Cast Iron, Chilled	50 to 150
3	36 x 36	Drop Forged Inserted Teeth	100 to 200
4	36 x 48	Drop Forged Inserted Teeth	125 to 225
5	42 x 48	Drop Forged Inserted Teeth	150 to 300
6	48 x 48	Drop Forged Inserted Teeth	175 to 350

Adjustable Coal Crushers

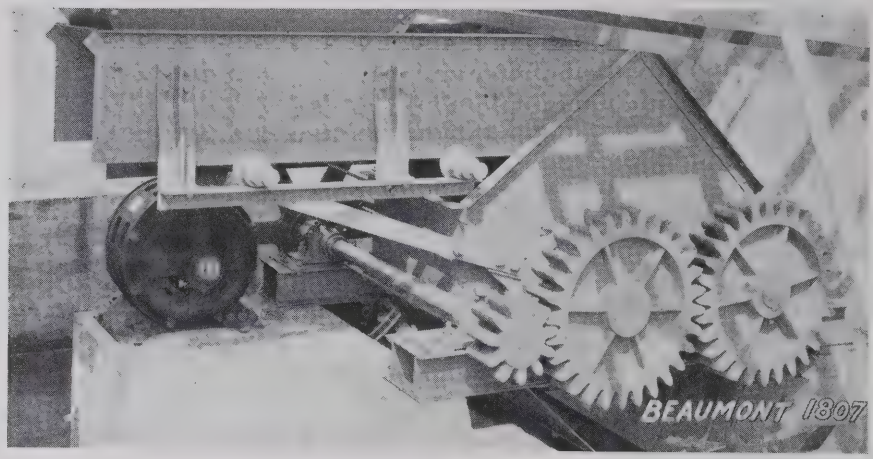
Number	Size	Rolls	Capacity, Tons per Hour
2-A*	30 x 30	Cast Iron, Chilled	30 to 150
3-A	36 x 36	Drop Forged Inserted Teeth	100 to 200
4-A	36 x 48	Drop Forged Inserted Teeth	125 to 225
5-A	42 x 48	Drop Forged Inserted Teeth	150 to 300
6-A	48 x 48	Drop Forged Inserted Teeth	175 to 350

*Can be furnished with drop forged inserted teeth

Capacity depends upon kind of coal, speed of rolls and horsepower of motor.

Features

1. Two large diameter rolls are used. This is necessary to crush run-of-mine coal. Smaller rolls will not "bite" the lumps.
2. Produces even sized product with minimum amount of fines.
3. Power consumption is at a minimum.
4. Spring relief bearings avoid injury to crusher.
5. Due to smooth crushing action dust is at a minimum.
6. Wear is distributed evenly over the entire crusher rolls.
7. Parts are all rugged and simple, designed for maximum wear.
8. Reduces mine-run coal to stoker size in one operation.
9. Safety shearing pin is provided on motor drive to release motor in case any foreign hard substance jams in the rolls.



View of 28-inch by 30-inch Crusher and Feeder

No. 1—28″ by 30″ Double Roll Coal Crusher

THIS machine is used to reduce mine run coal to 2 or 2½ inches at the rate of 30 to 75 tons per hour, capacity depending upon the roll speed and size of motor. Crusher is usually fed by the reciprocating feeder shown, but may be used with an apron, rotary or any other approved type of feeder.

Specifications

RECIPROCATING FEEDER consists of a reciprocating steel plate ¼ inch thick, placed under the outlet of a track or receiving hopper. The coal is retained on three sides of the plate by vertical ¼-inch steel plate guards. Feeder plate is fitted with 1½-inch square shafts journaled at ends to receive 4½-inch diameter single flanged cast iron wheels. Feeder axles terminate in external compression grease cups. Feeder plate reciprocates on 3-inch by 3-inch by 5/16-inch angle tracks, supported from the feeder sides by cast iron brackets. Reciprocation is accomplished by means of eccentrics on the crusher roll shaft. Feeder is 24 inches wide by 19 inches high.

Crusher

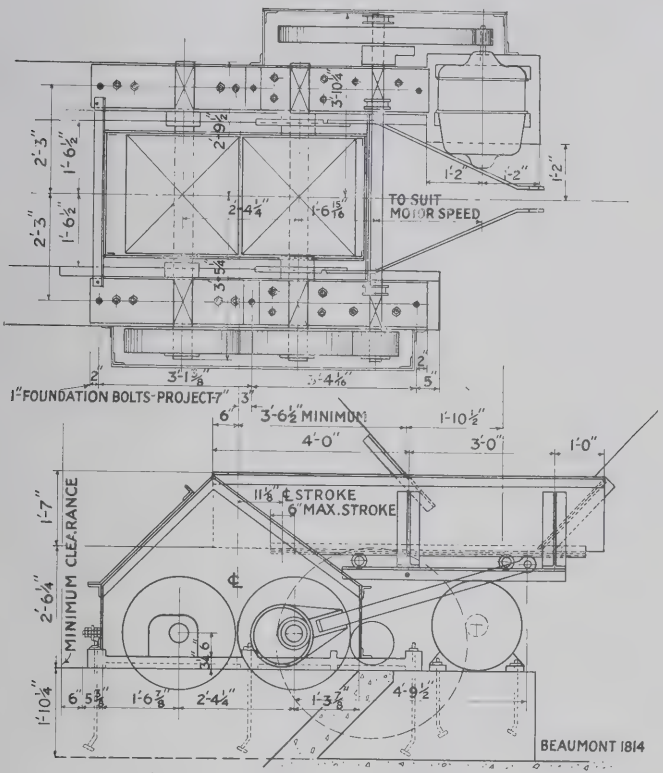
ROLLS are 28-inch diameter by 30-inch face. Each roll body is cast in one piece with heavy hubs. Teeth are cast solid with roll. Face of roll and teeth are chilled, producing a hard, long wearing surface.

SHAFTS AND BEARINGS. Roll shafts are 4 7/16 inches diameter and countershaft 2 15/16 inches diameter. Bearings on roll shaft are 12¼ inches long and are extra heavy. All bearings are lined with high-grade babbitt metal, bored and scraped to a perfect fit for shafts. Bearings on one roll are fitted with car springs to absorb crushing shock and to permit crusher rolls to open up and pass any foreign hard substance in the coal. These bearings have ½-inch adjustment on the base plates. Lubrication is by compression grease cups.

BASE PLATES are cast iron and of substantial pattern, amply strong to withstand the impact and strain when rolls are working at their maximum capacity. They are accurately machined on lower surfaces to insure proper alignment on all shaft bearings. When crusher is mounted on steel beams, cast iron base plates are omitted. Crusher beams each consist of two steel channels about 9 inches back to back with ¼-inch cover plates top and bottom.

GEARING. Spur wheels and pinion are long tooth, extra heavy pattern, high-grade cast iron. Pinion is double shrouded. Gears are 6-inch face, teeth 2¼ inches thick at root. Safety shearing pin is provided on motor drive gear to release the motor in case any foreign hard substance jams in the rolls. Driving gear is cut cast iron. Light plate guards are provided around all gears.

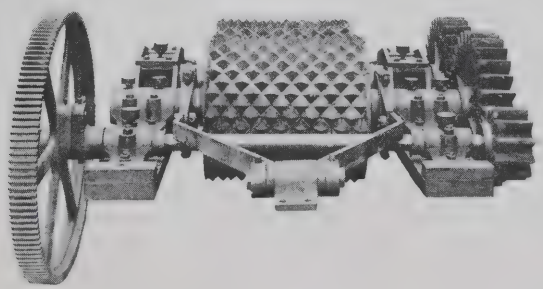
HOUSING is built of ¼-inch steel plate sides and 3/16-inch steel plate cover.

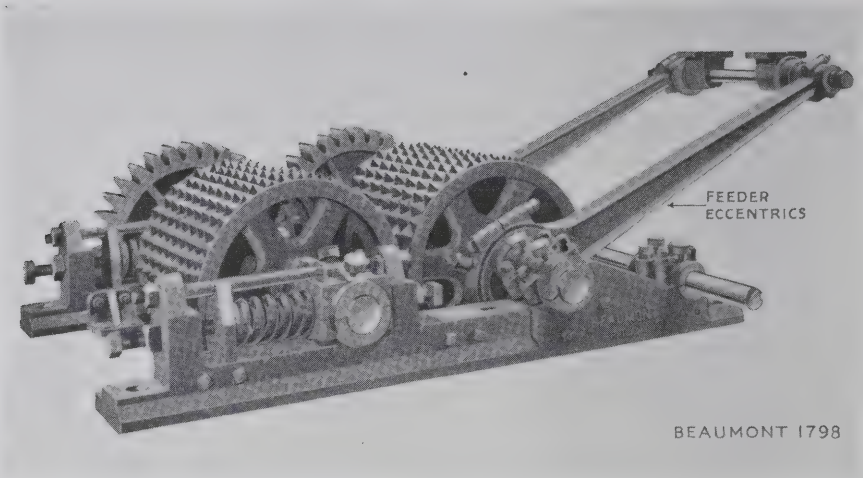


No. 1—28″ by 30″ Double Roll Crusher and Feeder

Table of Capacities

	2-inch Product				2½-inch Product				
Tons per Hour . . .	30	40	50	75	30	40	50	60	75
H.P. Motor	10	12	15	25	10	12	15	15	20
Roll Speed—R.P.M. .	39	39	39	60	39	39	39	44	50





View of 30-inch by 30-inch Crusher with Casing and Pulley Removed

No. 2—30″ by 30″ Double Roll Coal Crusher

THIS machine is used to reduce mine run coal to 2 or 2½ inches at the rate of 50 to 150 tons per hour, capacity depending upon the roll speed, size motor and size coal desired. Crusher is usually fed by a reciprocating feeder, but may be used with an apron, rotary or any other approved type feeder.

Specifications

Crusher

Rolls are 30-inch diameter by 30-inch face. Each roll body is cast in one piece, with heavy hubs. Teeth are cast solid, with roll. Face of roll and teeth are chilled, producing a hard, long wearing surface.

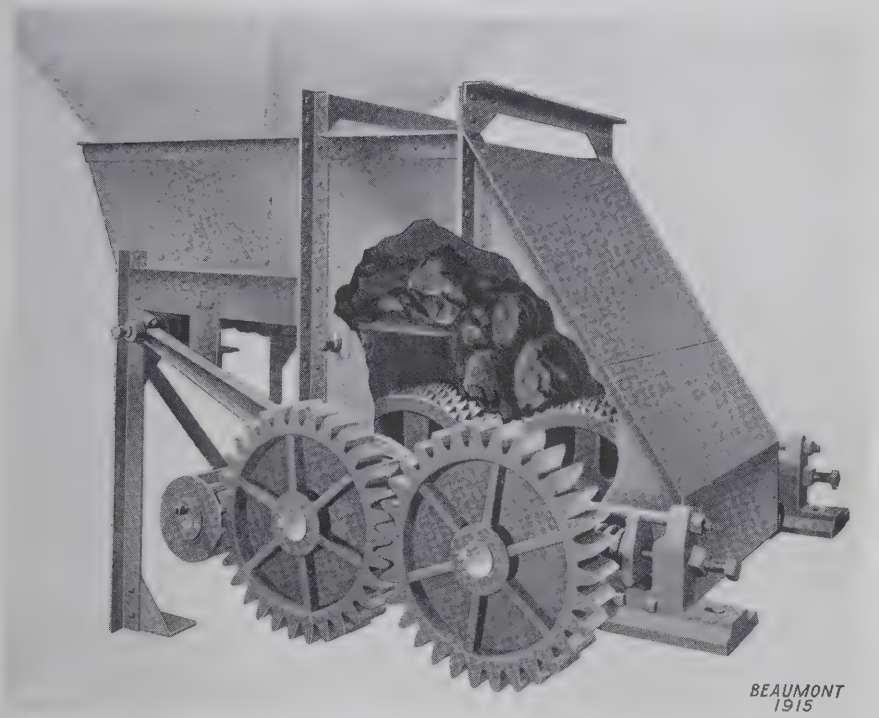
Shafts and Bearings. Roll shafts are 4 7/16-inch diameter and countershaft 2 15/16-inch diameter. Bearings on roll shaft are 12¼ inches long and are extra heavy. All bearings are lined with high-grade babbitt metal, bored and scraped to a perfect fit for shafts. Bearings on one roll are fitted with car springs to absorb crushing shock and to permit crusher rolls to open up and pass any foreign hard substance in the coal. These bearings have ½-inch adjustment on the base plates. Rigid bearings are cast integral with base plates, those on the roll shaft being split at an angle to take the thrust. Lubrication is by compression grease cups.

Base Plates are of cast iron and of substantial box section, amply strong to withstand the impact and strain when rolls are working at their maximum capacity. They are accurately machined on their lower surfaces to insure proper alignment of all shaft bearings.

Gearing and Pulley. Spur wheels and pinion are long tooth, extra heavy pattern, high-grade cast iron. Pinion is double shrouded. Gears are 6-inch face, teeth 2¼ inches thick at root. They are guarded over face of teeth by an iron band. Driving pulley is the fly wheel type, extra heavy construction, split pattern, properly balanced and bolted together. A safety shearing pin is provided on pulley to release motor in case any foreign hard substance jams in the rolls.

Housing is built of ¼-inch steel plate with ¾-inch steel wearing plates opposite the mesh of the rolls. Housing is sectional, allowing for easy removal of crusher.

This Crusher can also be furnished with drop forged inserted steel teeth.

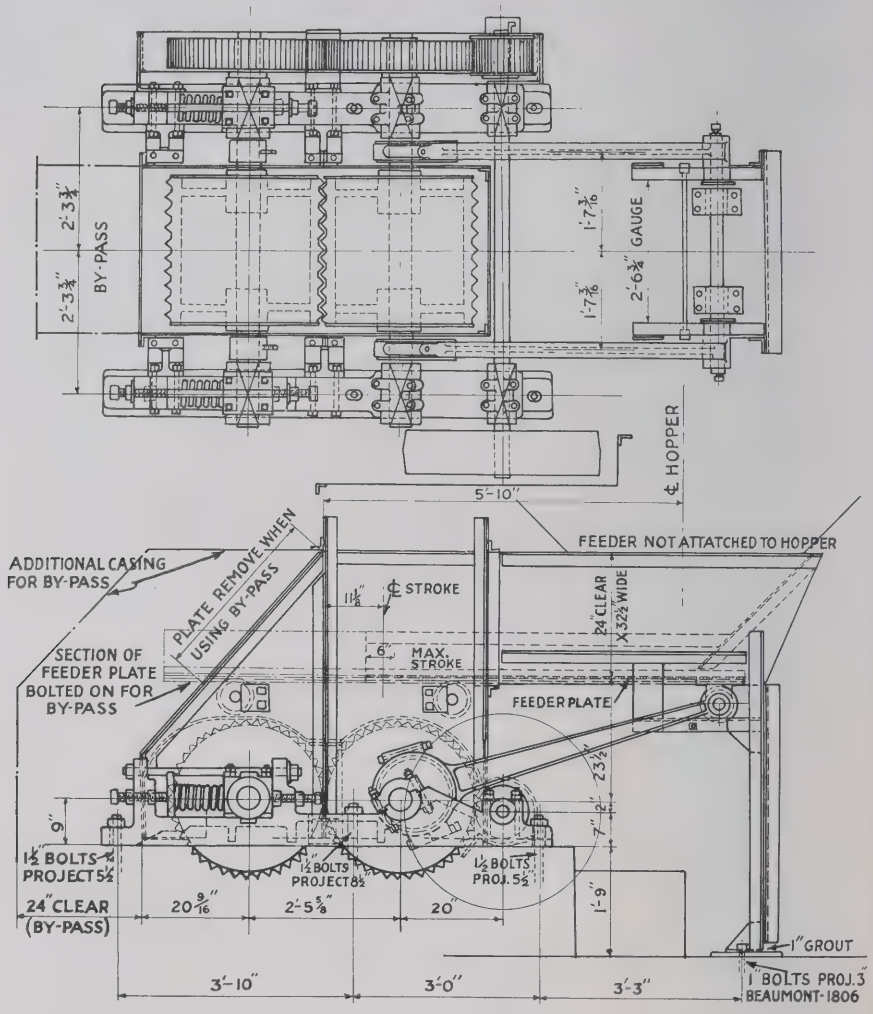


No. 2—30″ by 30″ Double Roll Coal Crusher and Feeder

Specifications

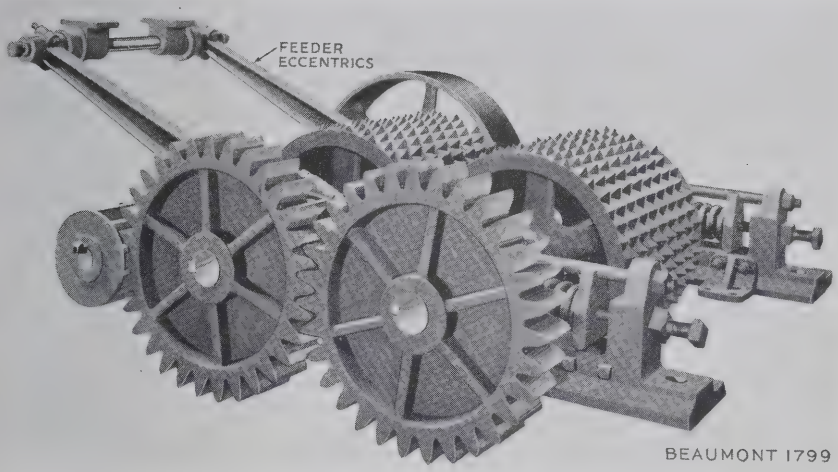
Reciprocating Feeder

CONSISTS of a reciprocating steel plate ¼-inch thick placed under the outlet of a track or receiving hopper. The coal is retained on three sides of the plate by vertical ¼-inch steel plate guards. Feeder plate travels on 6-inch diameter single flanged wheels. Reciprocation is accomplished by eccentrics on the crusher roll shaft and I-beam section cast iron eccentric arms. Feeder is self-supporting, being part of a substantial steel frame bolted direct to the crusher floor. Inside dimensions of feeder are 32½ inches wide by 24 inches high.



No. 2—30″ by 30″ Double Roll Coal Crusher and Feeder

NOTE the provision for by-passing coal around the crusher, shown in dotted lines. An extension is bolted on the feeder plate and crusher casing is extended so that coal is carried across crusher rolls and dropped down the 24-inch space at the end of the crusher. Feeder is self-contained and can be used to feed coal to any type crusher.



Gear Side of 30-inch by 30-inch Crusher—Casing Removed

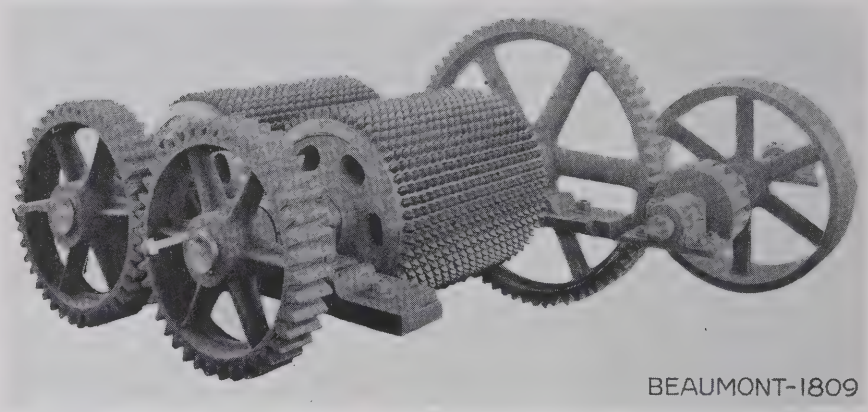
No. 2—30″ by 30″ Double Roll Coal Crusher

EVERY effort has been made in the design of this machine to produce a crusher combining all the known advantages gathered in our years of experience in building crushers. Careful consideration has been given to the points of durability, all parts being designed with more than ample strength for the purpose intended.

This machine is the one used in the average size modern industrial or central station boiler house. It has all the advantages of a double roll crusher with the added feature of extreme simplicity and durability.

Table of Capacities

	2-inch Product				2½-inch Product				
Tons per Hour . . .	50	75	112	125	50	75	112	125	150
H.P. Motor	15	25	35	40	15	20	25	30	40
Roll Speed—R.P.M. .	36	54	80	90	30	44	64	72	87



Super Capacity Crusher, Compound Geared, Housing and Gear Guards Removed

Super Capacity Double Roll Coal Crusher

Nos. 3–4–5–6

THIS machine is used to reduce mine run coal to 2 or 2½ inches at the rate of 100 to 350 tons per hour, capacity depending upon the roll speed, size motor and size coal desired. Crusher may be fed by the reciprocating, apron or other approved type feeder.

Specifications

ROLLS are cast iron with forged steel teeth driven into the roll shell. Roll body is cast in one piece with heavy hubs.

SHAFTS AND BEARINGS: Roll shafts are high-grade machinery steel. Bearings on roll shaft are 14 inches long. All bearings are extra heavy type, lined with high-grade babbitt metal bored and scraped to a perfect fit for shafts. Bearings on one roll are fitted with car springs to absorb crushing shock and to permit crusher rolls to open up and pass any foreign hard substance in the coal. These bearings have ½-inch adjustment on the base plates. Lubrication is by compression grease cups.

BASE PLATES are cast iron of heavy design, amply strong to withstand the impact and strain when rolls are working at their maximum capacity. They are accurately machined on both upper and lower surfaces to insure proper alignment of all shaft bearings.

GEARING AND PULLEY: The spur wheels and pinion are of extra heavy pattern, high-grade cast iron. Pinion is double shrouded. Light steel plate guards are provided around all gears. Driving pulley is the fly wheel type, extra heavy, construction split pattern, properly balanced and bolted together. A safety shearing pin is provided on pulley to release motor in case any foreign hard substance jams in the rolls.

HOUSING is built with cast iron side plates, properly ribbed and bolted together and either cast iron or ¼-inch steel top and end plates, reinforced with angles.

ASSEMBLING: The crusher is assembled complete at the shop to insure proper fit. All parts are then properly marked for field erection.

Beaumont Super Capacity Crusher Capacities

In Tons per Hour

No. 3—36″ by 36″ Crusher

	2-inch Product				2½-inch Product				
Tons per Hour	100	125	150	175	100	125	150	175	200
H.P. Motor	30	40	45	60	25	30	40	45	50
Roll Speed—R.P.M.	35	44	53	61	30	38	45	53	60

No. 4—36″ by 48″ Crusher

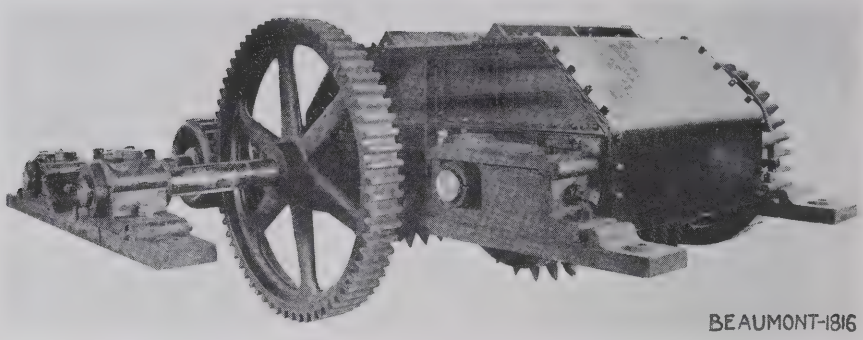
	2-inch Product				2½-inch Product				
Tons per Hour	125	150	175	200	125	150	175	200	225
H.P. Motor	40	50	60	65	35	45	50	60	65
Roll Speed—R.P.M.	35	42	49	56	30	36	42	48	54

No. 5—42″ by 48″ Crusher

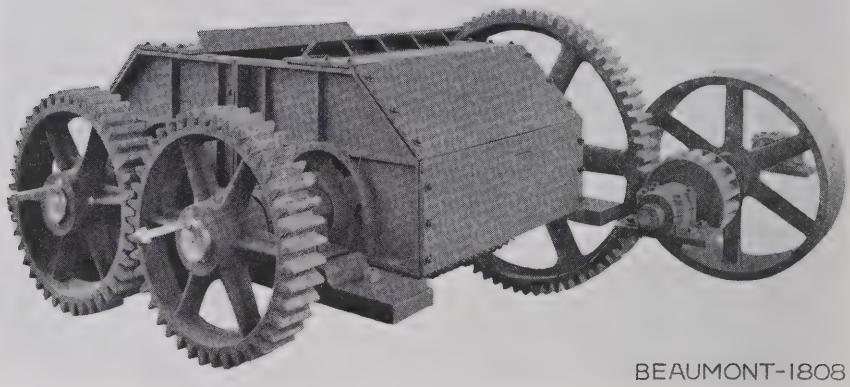
	2-inch Product				2½-inch Product				
Tons per Hour	150	175	200	250	150	175	200	250	300
H.P. Motor	50	60	70	85	40	50	55	70	80
Roll Speed—R.P.M.	30	35	40	50	25	30	34	42	50

No. 6—48″ by 48″ Crusher

	2-inch Product				2½-inch Product				
Tons per Hour	175	200	250	300	175	200	250	300	350
H.P. Motor	60	70	90	100	50	60	75	85	100
Roll Speed—R.P.M.	25	29	36	43	20	23	29	35	40



Super Capacity Crusher with Steel Casing



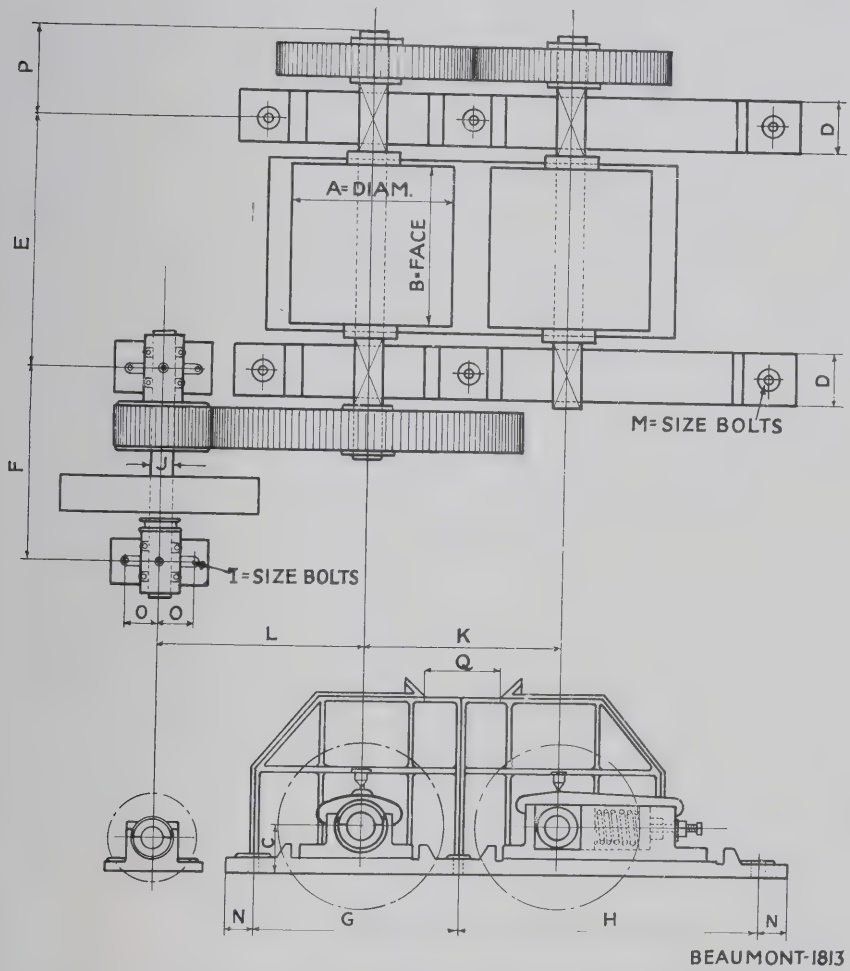
Super Capacity Crusher with Cast Iron Casing

Super Capacity Crusher

Nos. 3–4–5–6

FOR large central stations, industrial boiler houses, or for big coal mines, the Beaumont Super Capacity Crusher is the most desirable. Its proven strength and durability have made it the favorite machine for use in all coal crushing service where continuous operation and minimum maintenance service are required.

This machine is furnished in either all steel or all cast iron housing, as desired. Both housings are sectional and easily removed.

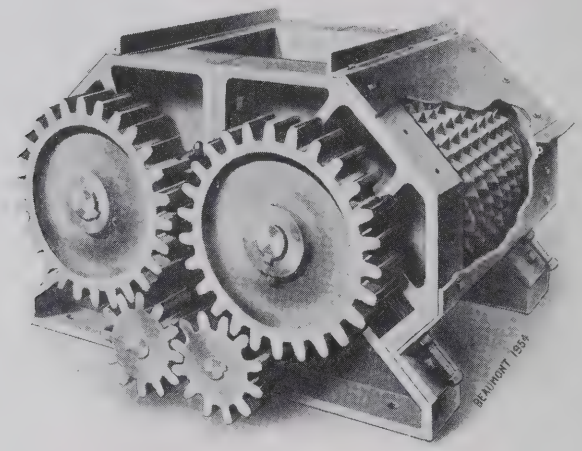


Super Capacity Double Roll Coal Crusher

Nos. 3–4–5–6

Dimensions

No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	Roll Shaft Diam.	Jrnal. Lgth.
3 . .	36″	36″	11½″	10″	55″	66″	44″	58½″	1⅜″	4⅞″	38″	42″	1½″	4″	5⅛″	19½″	25¾″	6⅞″	14″
4 . .	36″	48″	11½″	10″	67″	66″	44″	58½″	1⅜″	4⅞″	38″	42″	1½″	4″	5⅛″	19½″	25¾″	6⅞″	14″
5 . .	42″	48″	11½″	10″	67″	66″	48″	64″	1⅜″	4⅞″	44″	42″	1¾″	4″	5⅛″	19½″	26″	6⅞″	14″
6 . .	48″	48″	12″	12″	69″	66″	52″	67″	1⅝″	5⅜″	50″	42″	1¾″	4″	5⅛″	19½″	26″	7⅞″	14″



The Beaumont Patented Adjustable Double Roll Coal Crusher

Nos. 2-A, 3-A, 4-A, 5-A and 6-A

THIS patented machine is used when it is desired to crush mine run coal to 2 inches or any size up to 6 inches. Machine is built in five sizes to crush from 30 to 350 tons per hour, depending upon the roll speed and the size coal desired.

Crusher may be fed by the reciprocating, apron or other approved type of feeder.

Specifications

ROLLS are cast iron with forged steel teeth driven into the roll shell, excepting the No. 2-A machine, which has teeth cast solid with roll and chilled. Roll body is cast in one piece with heavy hubs.

SHAFTS AND BEARINGS: Roll shafts are high-grade machinery steel. Bearings on roll shaft are provided with screw adjustments. All bearings are extra heavy, lined with high-grade babbitt metal, bored and scraped to a perfect fit for shafts. Roll bearings are fitted with car springs to absorb crushing shock and to permit crusher rolls to open up and pass any foreign hard substance in the coal. Lubrication is by compression grease cups. Brass adjustment screws are used on bearings to prevent rusting.

GEARING AND PULLEY: The spur gears and pinions are cast iron, keyed rigidly to shafts. Driving pulley is the fly wheel type, extra heavy construction split pattern, properly balanced and bolted together. A safety shearing pin is provided on motor drive to release motor in case any foreign hard substance jams in the rolls.

HOUSING is built with cast iron sides in which all bearings are mounted. Sides are properly ribbed and bolted together and are easily removable. Top and end plates are ¼-inch steel plate reinforced with steel angles.

The Beaumont Patent Adjustable Crusher Capacities

In Tons per Hour

No. 2-A—30″ by 30″ Adjustable Crusher

	2-inch Product				2½-inch Product				
Tons per Hour	50	75	112	125	50	75	112	125	150
H.P. Motor	15	25	35	40	15	20	25	30	40
Roll Speed—R.P.M.	36	54	80	90	30	44	64	72	87

No. 3-A—36″ by 36″ Adjustable Crusher

	2-inch Product				2½-inch Product				
Tons per Hour	100	125	150	175	100	125	150	175	200
H.P. Motor	30	40	45	60	25	30	40	45	50
Roll Speed—R.P.M.	35	44	53	61	30	38	45	53	60

No. 4-A—36″ by 48″ Adjustable Crusher

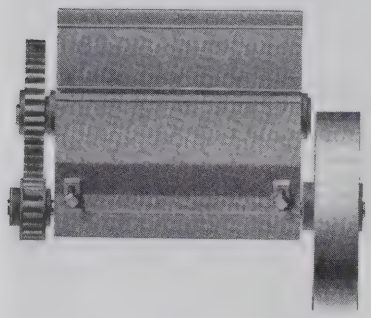
	2-inch Product				2½-inch Product				
Tons per Hour	125	150	175	200	125	150	175	200	225
H.P. Motor	40	50	60	65	35	45	50	60	65
Roll Speed—R.P.M.	35	42	49	56	30	36	42	48	54

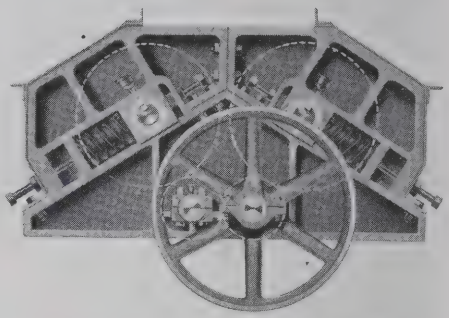
No. 5-A—42″ by 48″ Adjustable Crusher

	2-inch Product				2½-inch Product				
Tons per Hour	150	175	200	250	150	175	200	250	300
H.P. Motor	50	60	70	85	40	50	55	70	80
Roll Speed—R.P.M.	30	35	40	50	25	30	34	42	50

No. 6-A—48″ by 48″ Adjustable Crusher

	2-inch Product				2½-inch Product				
Tons per Hour	175	200	250	300	175	200	250	300	350
H.P. Motor	60	70	90	100	50	60	75	85	100
Roll Speed—R.P.M.	25	29	36	43	20	23	29	35	40





BEAUMONT—1845

The Beaumont Patented Adjustable Double Roll Coal Crusher

Nos. 2-A, 3-A, 4-A, 5-A and 6-A

Features

1. Rolls can be adjusted from 2 inches to 6 inches in field without affecting mesh of gears and without using bevel or sliding gears, and stud shafts or idler gears.

2. Side frames are cast iron, heavily ribbed and bolted together, and are easily removable.

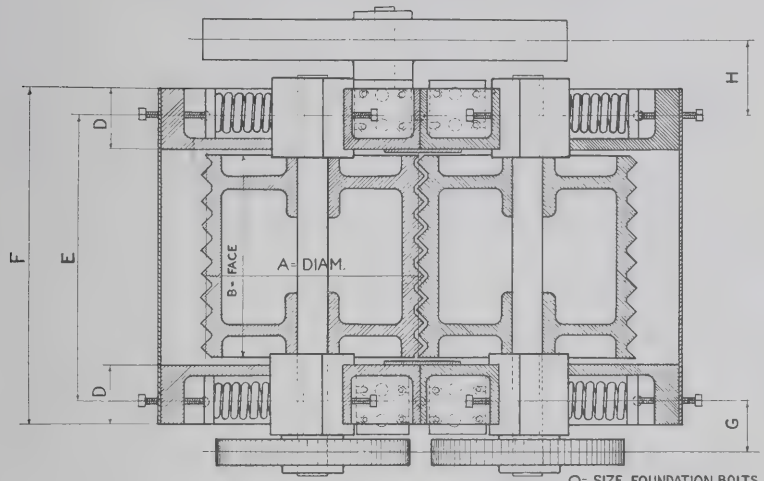
3. Bearings are built into the side frames, thus insuring permanent alignment.

4. Adjusting screws are brass and will not corrode. Ordinary bolts would rust tight and make adjustment impossible.

5. Safety shearing pin is provided on the drive pulley to release the motor in case any foreign hard substance jams in the rolls.

6. Crusher is of the double roll type, therefore possessing all the advantages of this type crusher as given on pages 204 and 205.

The Beaumont Patent Adjustable Double Roll Coal Crusher



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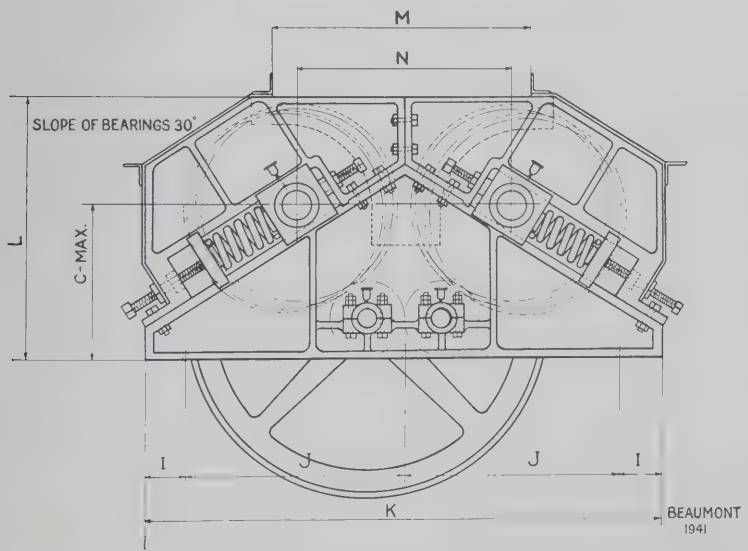
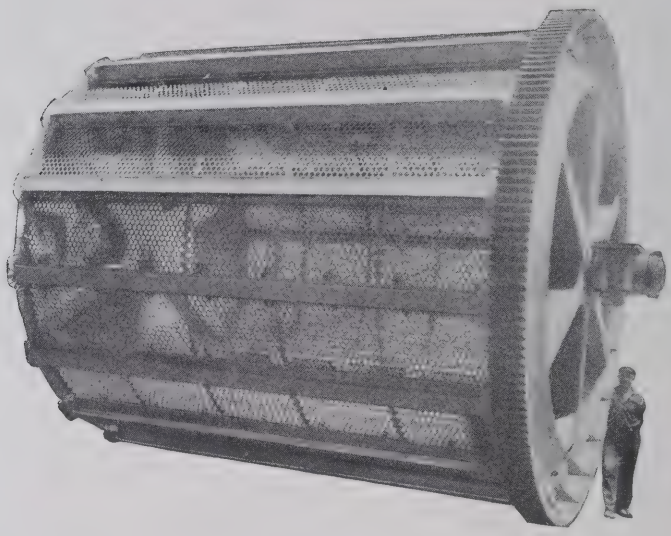


A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Roll Shaft Diam.	Jrnl. Lgth.
30″	30″	28″	10″	42″	52″	9½″	12½″	9″	27″	72″	46″	32″	30″	1¼″	4 7/16″	12″
36″	36″	30″	12″	50″	62″	12¼″	14½″	9″	33″	84″	51″	38″	38″	1½″	6⅞″	14″
36″	48″	30″	12″	62″	74″	12¼″	14½″	9″	33″	84″	51″	38″	38″	1½″	6⅞″	14″
42″	48″	31½″	12″	62″	74″	12¼″	14½″	9″	39″	96″	55″	44″	44″	1¾″	6⅞″	14″
48″	48″	33″	12″	62″	74″	13″	15½″	9″	45″	108″	60″	50″	50″	1¾″	7⅞″	14″



Pennsylvania Bradford Coal Breaker and Cleaner

THIS device is a powerful, slow-moving machine for crushing, cleaning and sizing bituminous coal. The coal is crushed by gravity impact and passes the perforations, accurately sized, as soon as it is sufficiently broken. The harder refuse, such as bone, slate, binder, sulphur balls, rock, tramp iron and wood, which resists breaking, is automatically discharged.

These Breakers are furnished in twelve sizes, ranging from 6-foot diameter by 8-foot length to 12-foot diameter by 22-foot length.

The capacities range from 30 to 500 tons per hour.

The construction involves two massive one-piece cast steel spiders, accurately machined and connected by heavy steel beams.

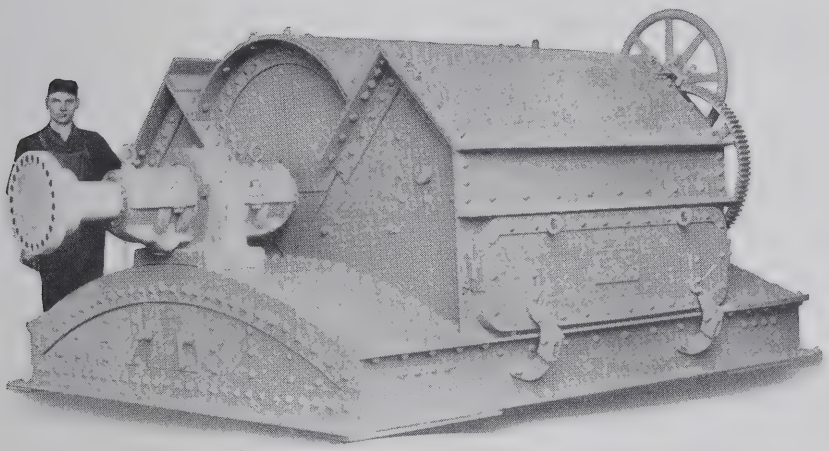
FRAME WORK is covered with thick steel plates perforated to the size required for each particular job. The interior equipment consists of heavy steel lifting shelves, deflectors and discharge plows.

BEARINGS are of the ball and socket type, fitted with removable bronze liners.

DRIVE is effected by means of a heavy cast steel gear, securely bolted to one spider and a steel pinion mounted on the countershaft, which also carries the driving pulley.

SUPPORTS usually supported in the tipple or crusher building from special floor beams, from which the bearings are hung by means of forged and turned steel bolts of large diameter.

In those cases where cleaning to reduce the ash or sulphur content is a major consideration, it is essential to examine each particular coal to determine the diameter, length and equipment of Breaker necessary to handle it to best advantage. This examination is not necessary in those cases where the purpose of the installation is simply to crush and accurately size large tonnages of coal at minimum cost, and to automatically throw out the tramp iron, stone, wood and other miscellaneous hard refuse.



Pennsylvania Hammer Crusher

THIS machine is used for fine crushing. The hammer crusher reduction principle involves driving the material, as it drops into the crusher, against heavy breaker plates by means of the high-speed hinged hammers. This initial impact crushing is immediately followed by the finer reduction over a cage, fitted with suitable openings to deliver the desired fineness of product.

THE FRAME is fabricated from heavy steel plates, channels, angles and massive bearing pedestals.

THE ROTOR consists of a powerful forged steel shaft to which are heavily keyed a series of rolled steel suspension and spacer discs, accurately machined and balanced, and carrying the special steel hammers on large diameter suspension bolts.

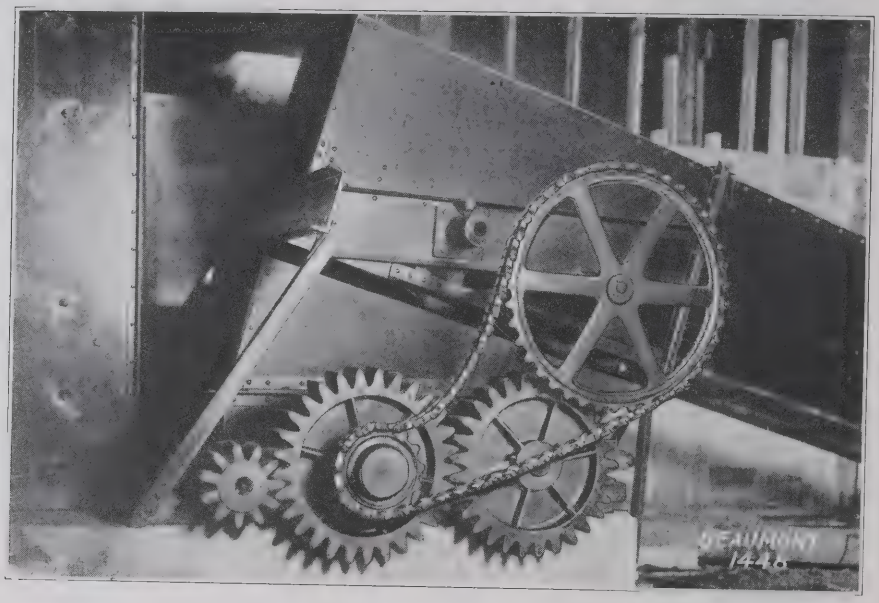
THE CAGE is made up of a heavy cast steel frame, accurately machined, and carrying perforated steel screen plates, manganese grates, or bars as the service demands. This cage is adjustable while the machine is in operation by means of patented rack and pinion construction, permitting operator to control fineness and to compensate for hammer and cage wear.

THE BEARINGS are specially designed for this exacting service. In the larger sizes, massive, rigid, ring-oiling bearings are employed, and heavy duty double ball bearings for the smaller sizes. Unusual care is employed to make both types dust proof.

TRAMP IRON SEPARATOR is a patented device which automatically collects tramp iron and other metallic refuse by simple mechanical means, requiring no power or labor aside from occasional dumping.

Built in thirteen sizes, with capacities ranging from 20 to 300 tons hourly, reducing 1½-inch coal to ⅛ inch and under.

Complete information will be furnished on receipt of samples or description of material to be handled, approximate size of feed, desired fineness of product and advices regarding operating conditions.



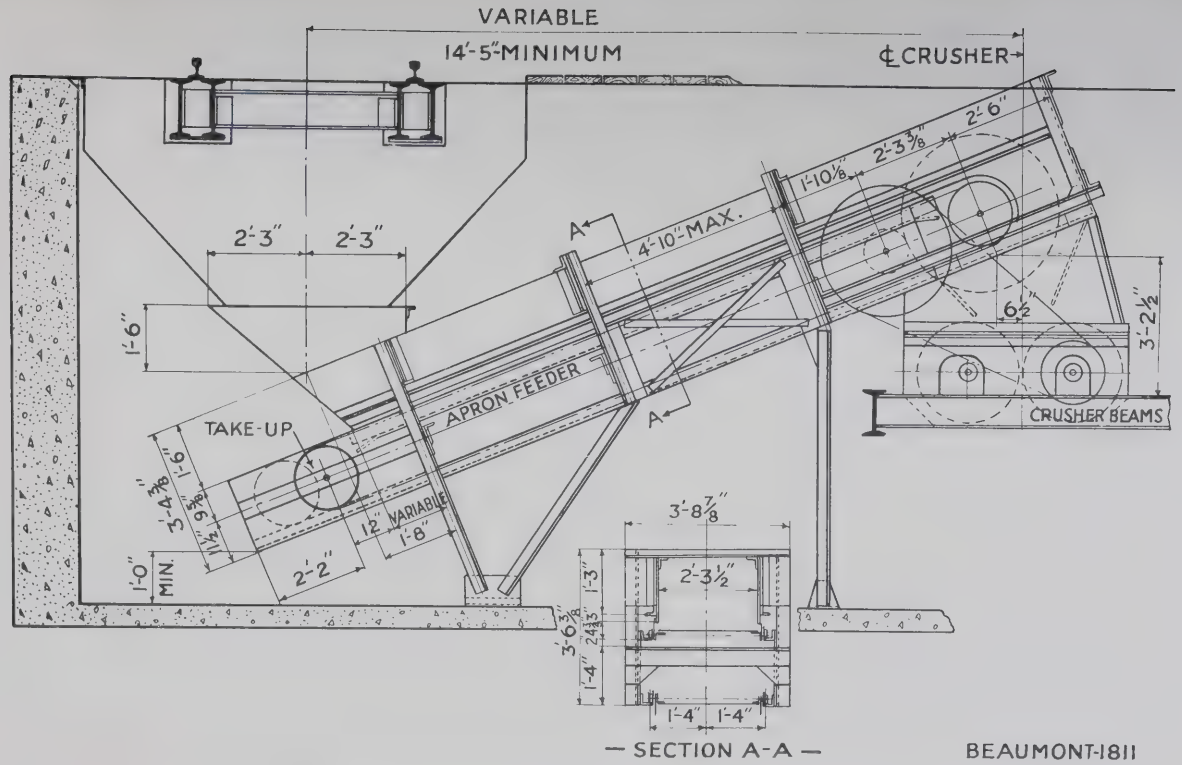
30-inch Apron Feeder

AN apron feeder is used when coal must be elevated while feeding the crusher or where the crusher is located too far away from the track hopper to permit the use of a reciprocating feeder. It may be operated on the horizontal or up to 22½ degrees from the horizontal.

Specifications

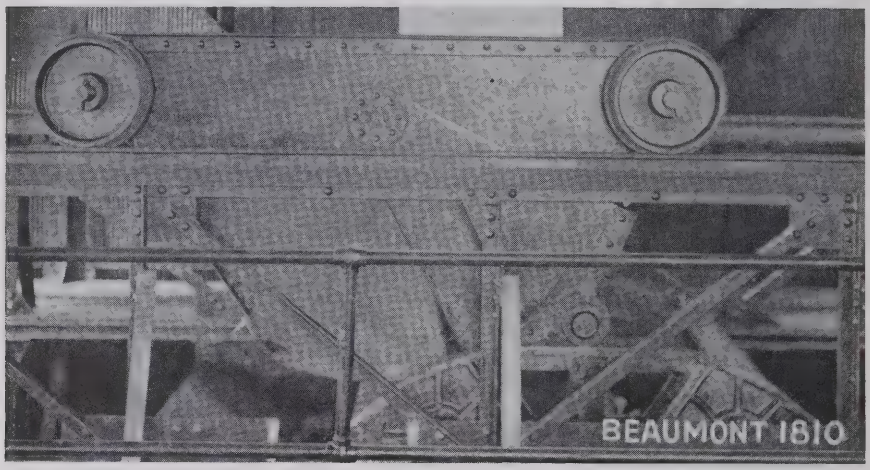
Consists of a series of overlapping steel plate aprons 30 inches wide by 3/16 inch thick, of the beaded and curved flight type. Aprons are suspended between 9-inch pitch steel thimble roller chain.

Feeder operates in a substantial structural steel frame, having 3/16-inch by 18-inch stationary sides at the carrying run of the apron to retain coal on the apron. Return run of apron rolls on 3½-inch by 3½-inch by 5/16-inch angles riveted to the feeder frame. Feeder is driven from the crusher roll shaft by a chain drive.



Layout of Track Hopper, Apron Feeder and Crusher

(Crusher shown is No. 1)



RandS Patent Tram Car

THIS device consists of a car with a pivoted undercut gate on the bottom. It receives coal direct from the skip bucket and discharges into the coal bunker. Car is pulled by an endless steel cable attached to a drum driven from the skip hoist winding machine. Cable is reeved, so that car makes a complete travel of the coal bunker and return for one complete cycle of the skip bucket.

Specifications

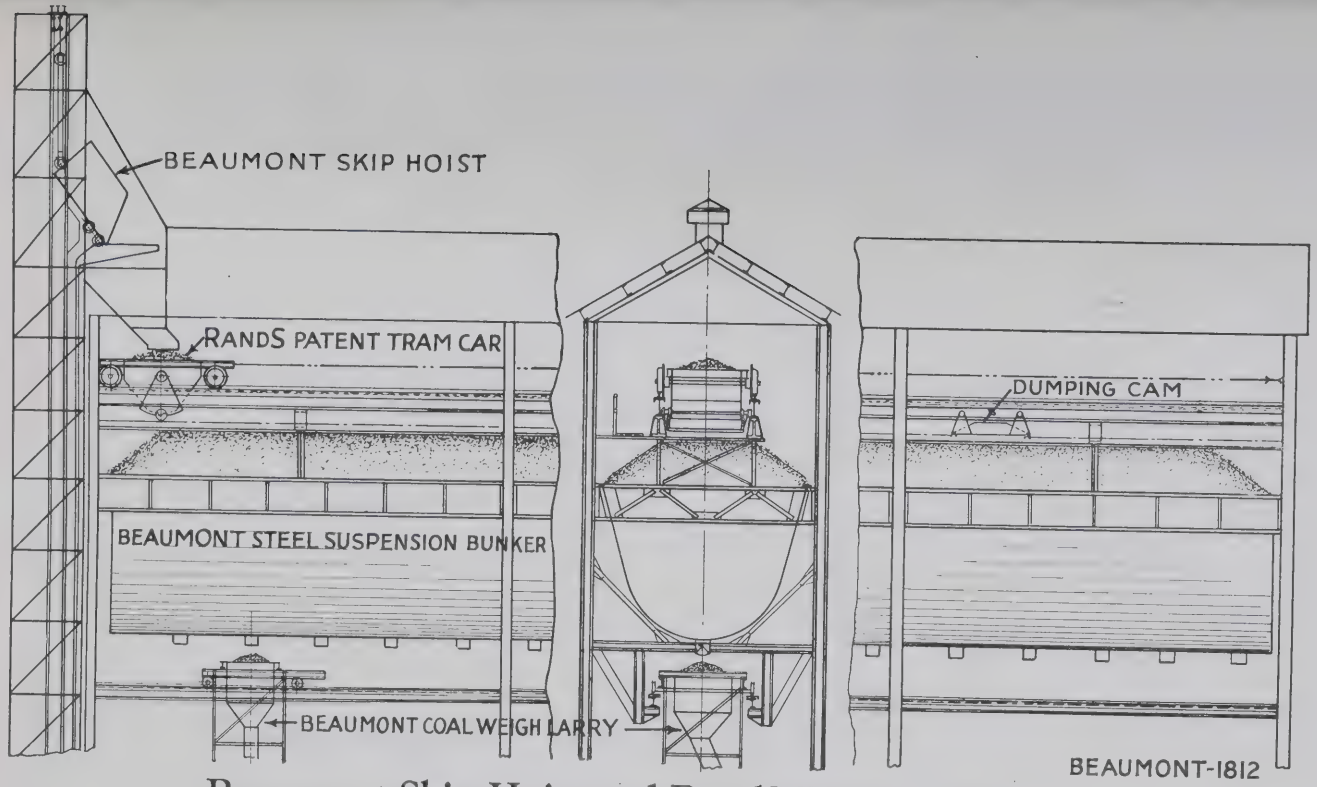
Tram car is constructed of ¼-inch steel plate, reinforced with angles. It will be provided with four 24-inch diameter cast iron single flange chilled tread wheels, which are keyed to 2 7/16-inch diameter through axles. Bearings are of the rocker type, babbitted and lubricated by compression grease cups.

The pivoted discharge gate is made of ¼-inch steel plate and is operated by a cast iron dumping carriage fitted with wheels and running on the lower flange of the beam, which supports the tram car track.

Tram car tracks are 20-pound T-rails, layed directly on top of steel I-beams, which in turn are supported above the bunker cross beams by cast iron pedestals.

Dumping carriage is attached to a ⅜-inch endless steel cable operated by a hand winch. Tram car can be made to discharge at any point by moving the dumping carriage.

Water Capacity Tram Car, Cubic Feet	Body Length	Width (Across Track)	Depth	Track Gauge
40	4′ 0″	4′ 0″	3′ 9″	6′ 0″
60	5′ 0″	4′ 0″	4′ 6″	6′ 0″
80	5′ 6″	5′ 6″	3′ 6″	7′ 6″
100	6′ 6″	5′ 6″	4′ 6″	7′ 6″
125	6′ 6″	5′ 6″	5′ 6″	7′ 6″



Beaumont Skip Hoist and RandS Patent Tram Car

Bunker Over Firing Aisle

This system is recommended where the Super-Central System with the external bunker cannot be used on account of local conditions. We hold exclusive rights to this device for use in boiler houses.

Independent Control Tram Car

IN cases where the length of the bunker greatly exceeds the height of lift of the skip hoist it is advisable to use an Independent Control Tram Car instead of the RandS Tram Car which is geared to the skip.

The Independent Control Tram Car is exactly the same size and type as the RandS Tram Car but is driven by an independent winding machine. An attendant starts the car by pushing a button, causing the car to shuttle back and forth over the bunker automatically until the stop button is pushed.

Dumping cam for the car is on wheels and can be placed at any point desired.

The hopper into which the skip discharges is large enough to hold several car loads. An automatic gate is provided on the hopper which is operated by the tram car.

Self-Control Tram Car

AS an alternate to the Independent Control Tram Car the Self-Control Tram Car is used. This consists of a self-dumping car of the same size and shape as the RandS car but is operated by a motor and gearing mounted on the car. Current for the motor is collected through standard conductor rails.

The control for the motor is mounted on the car and when the car hits the dumping cam a lever throws the control switch, reversing the motor and causing the car to return for another load. This operation is repeated at the loading point, thus the car shuttles back and forth over the bunker between the loading hopper and the dumping cam.

Either type car can be filled automatically by a gate operated by the car

Beaumont Gates

Types and Uses

THE question often arises as to the type of gate to use for certain purposes. Engineers, owners, etc., are presented this data on our standard equipment as a guide and with the assurance that being standard they will always operate satisfactorily and can be purchased for lower prices than those specially constructed to fit a certain case.

On equipment for handling coal and ashes, it is essential to have the proper size and type of gates for the successful operation of the machinery. When improperly made or used they are an unwarranted source of annoyance and expense.

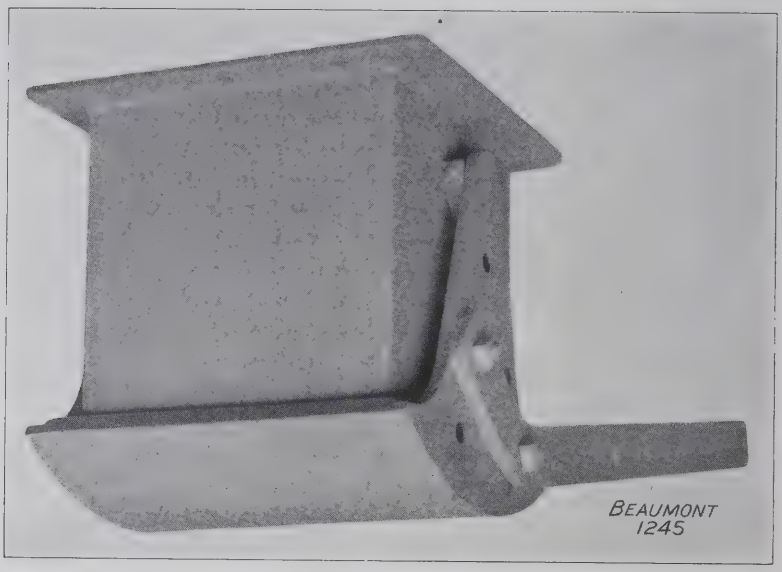
Those gates, which we have adopted as standard, have been developed through twenty years of study and experience and may be safely used without fear of future trouble.

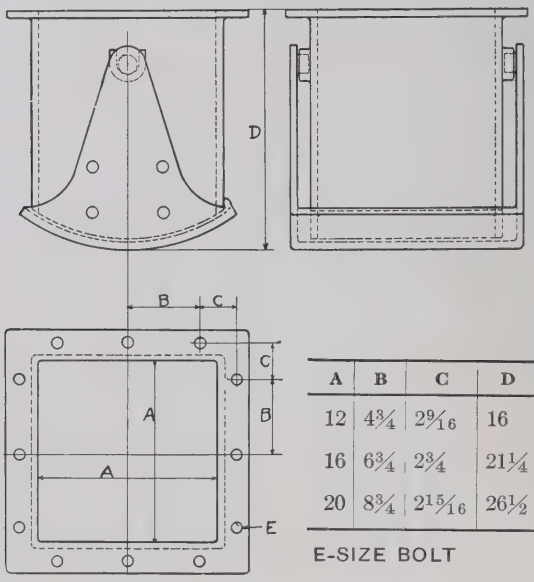
Our experience is at your disposal, and we are always ready to suggest the proper gate for any service.

The gates shown in the following pages are recommended for the service listed below:

Simplex Gates	Coal Bunkers
Duplex Gates	Ash Bunkers
Pivoted Ash Gates	Ash Hoppers when disposal is made to ash cars or larries
"Underdry" Ash Gates	Ash Hoppers when disposal is made direct to railroad cars, trucks or large cars.

12″ to 20″ Simplex Gates



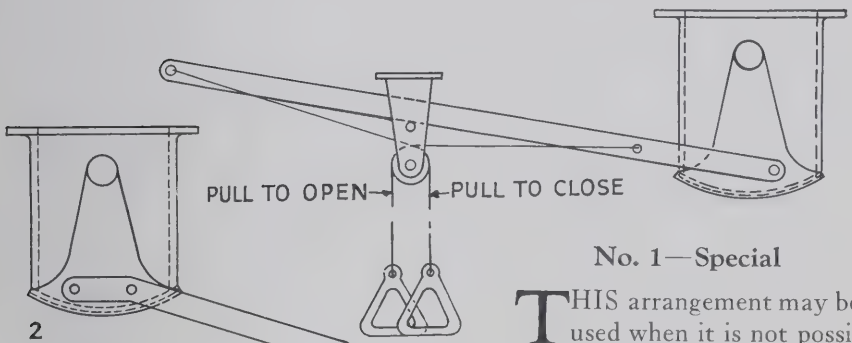


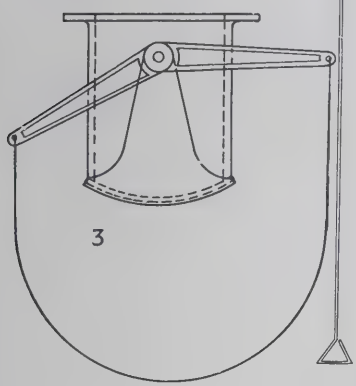
A	B	C	D	E	Wt.
12	4¾	2⁹⁄₁₆	16	¾	166
16	6¾	2¾	21¼	⅞	323
20	8¾	2¹⁵⁄₁₆	26½	⅞	550

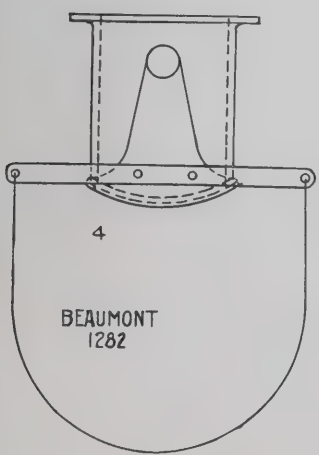
E-SIZE BOLT

Angular movement of gate jaw is 65 degrees

Methods of Operating Simplex Gates







No. 1—Special

THIS arrangement may be used when it is not possible to hang the operating ropes straight down from the gate as in the case where a larry or a car passes under the gates.

No. 2—Standard

This consists of a bent steel flat with an extension push rod to hang down where a man can reach it. The bend in the lever can be turned up or down. Also there are two sets of holes in the gate, giving four positions of the lever.

No. 3—Standard

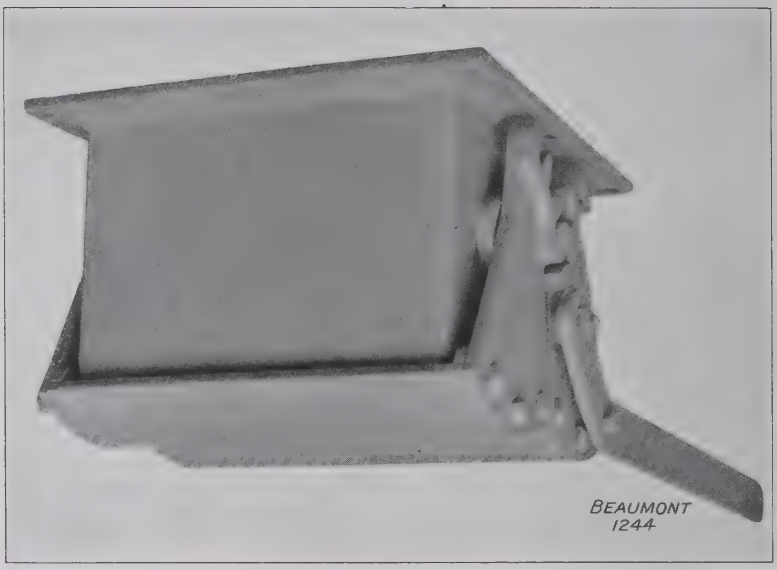
Especially suitable when the gate extends into the mouth of a chute. It consists of a double cast iron lever attached to the gate in such a way as to allow angular adjustment. It is operated from the floor by means of a hand chain.

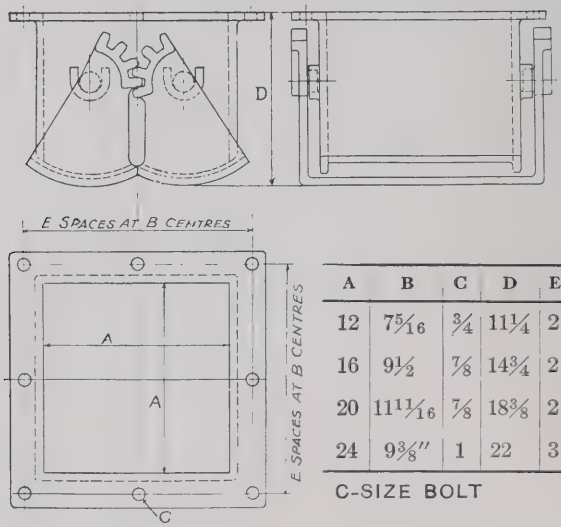
No. 4—Special

This is a simpler lever than No. 2 but cannot be used in any case where the gate must extend into the mouth of a chute.

All gates should hang normally closed and levers should be arranged so that gate can be positively shut

12″ to 24″ Duplex Gates



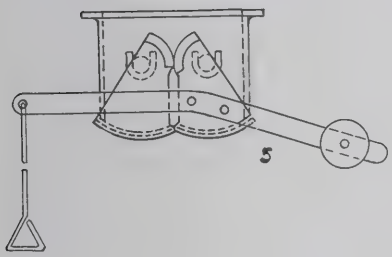


A	B	C	D	E	Wt.
12	7 5/16	3/4	11 1/4	2	128
16	9 1/2	7/8	14 3/4	2	264
20	11 11/16	7/8	18 3/8	2	440
24	9 3/8″	1	22	3	870

C-SIZE BOLT

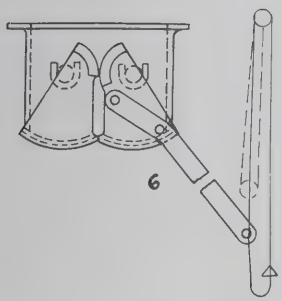
Angular movement of gate jaws is 60 degrees, except 24-inch gate, which is 74 degrees

Methods of Operating Duplex Gates



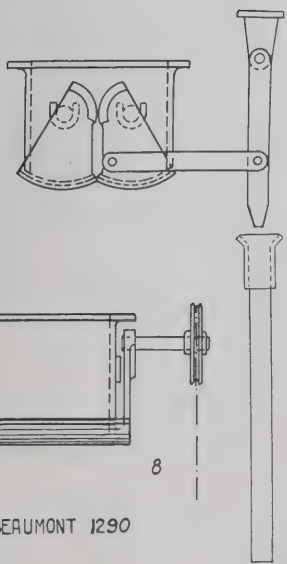
No. 5—Standard

THIS is a good type of lever for use on ash bunkers. It is counterweighted so that the weight of the lever will not hold the gate open.



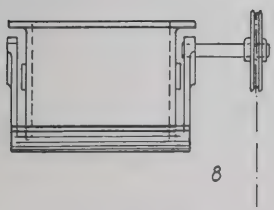
No. 6—Special

In this arrangement the lever tends to hold the gate shut, therefore it does not require a counter weight. It is opened by pulling on one side of the operating rope. A pull on the other side will close it tight.



No. 7—Special

Sometimes used when it is not permissible for anything to hang down. The detachable extension may be laid aside when not in use. A modification of this arrangement is to omit detachable part, extend lever to within reach of floor and make link which connects it to gate longer so that the lever will clear anything which may have to pass under the gate.



BEAUMONT 1290

No. 8—Special

A rag wheel and chain is sometimes applied to this type of gate.

All gates should hang normally closed and levers should be arranged so that gate can be positively shut

Beaumont Pivoted Ash Gates

Advantages

1. **Has a large opening** without the disadvantage of flooding the car when gate is opened wide to get the clinkers out.

2. **It is easy to operate** because it is counterweighted. The weight is so distributed that the gate will stay either open or closed but will not stay in an intermediate position.

3. **Clear view into hopper.** It permits the workman to look into the hopper and makes quenching easy.

4. **The gate is self-contained** and does not interfere with the workman when pushing the car. There are no projecting levers or counterweights to interfere with adjacent gates, or with the workmen.

5. **Maximum ash storage.** It permits the maximum ash storage with the minimum depth of basement.

6. **Large** enough to pass the largest clinker.

7. **Ample leverage** to open and shut positively.

8. **Non-binding.** There are no tracks, shafts and rollers to wear and collect dirt and ashes.

9. **Non-leaking.** Gate is tight enough to prevent ashes from leaking out, but will permit water to leak out.

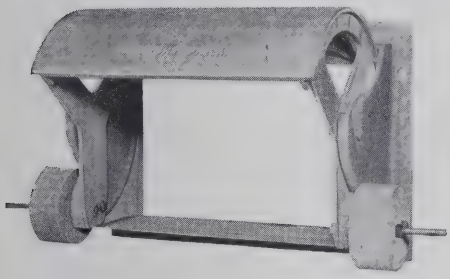
10. **Made of best quality cast iron** and will not warp or rust.

11. **Will not drip** hot water on the workmen.

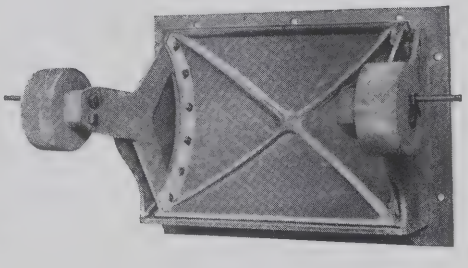
12. **Easy accessibility.** In most modern boiler settings using underfed stokers one of the chief wearing parts is the stoker dump plate and this must be repaired from time to time. About the only way to reach this is from the basement through the ash hopper or pit. Our gate can readily be taken out of its bearing, leaving the entire gate opening clear, through which a man can easily crawl.

Beaumont Pivoted Ash Gates

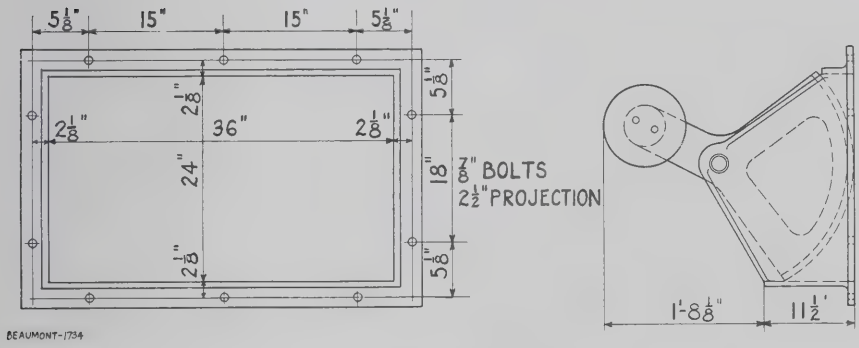
Hand Operated



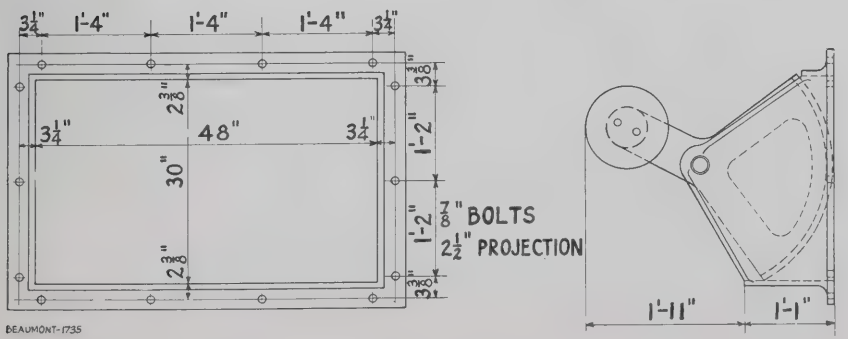
Open Position



Closed Position



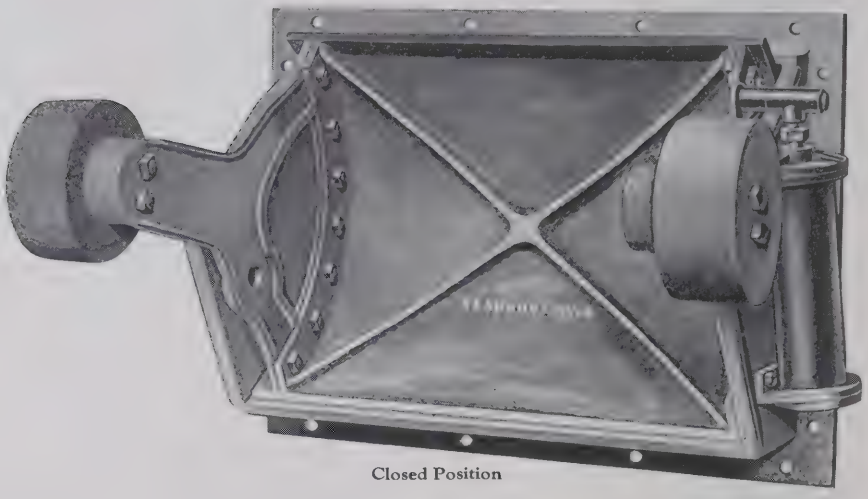
Bolt Spacing for 24″ by 36″ Gate



Bolt Spacing for 30″ by 48″ Gate

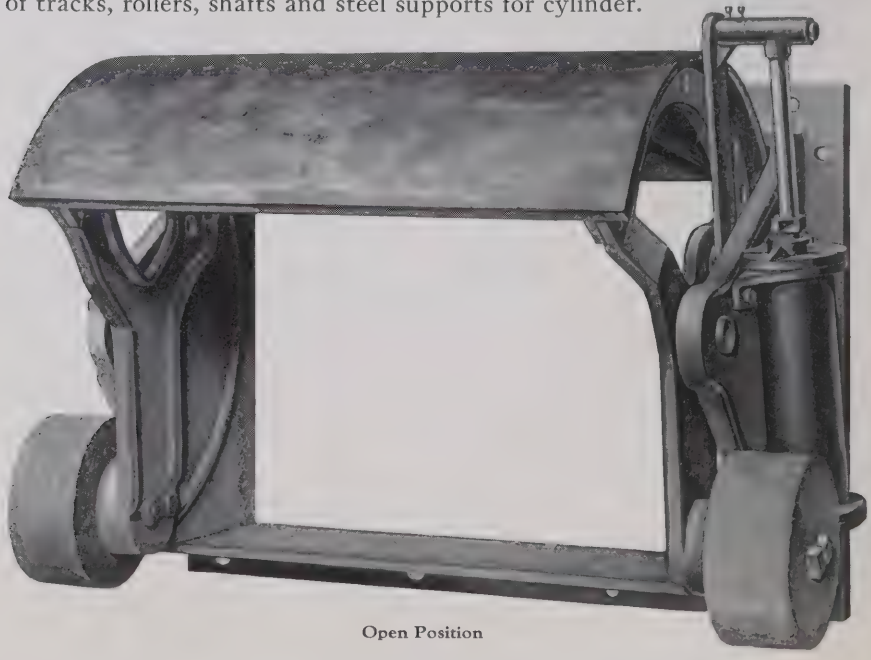
Beaumont Pivoted Ash Gates

Power Operated



Closed Position

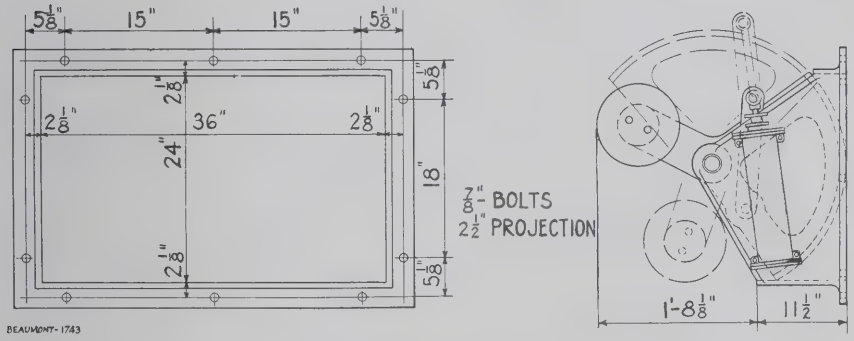
THE power operated gate is identical with the hand operated gate with the exception that a cylinder for operating the gate has been added. Cylinder may be used with either air or steam. This gate is self-contained and compact, cylinder being fastened direct to gate side. Note the absence of tracks, rollers, shafts and steel supports for cylinder.



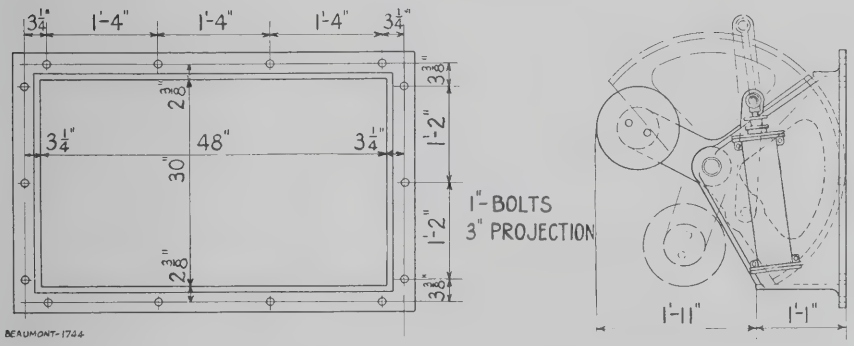
Open Position

Beaumont Pivoted Ash Gates

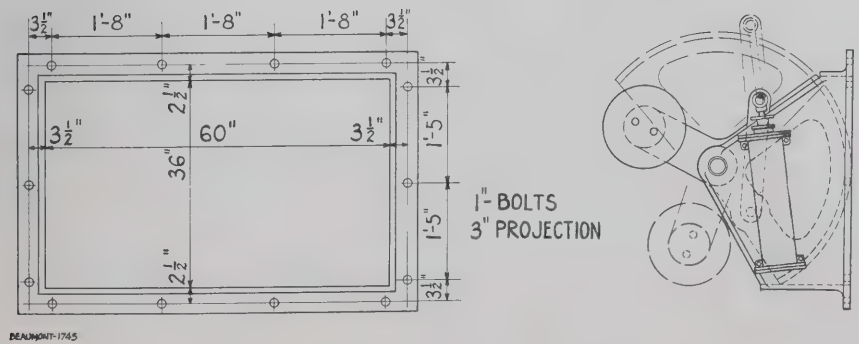
Power Operated



Bolt Spacing for 24″ by 36″ Gate



Bolt Spacing for 30″ by 48″ Gate



Bolt Spacing for 36″ by 60″ Gate

Beaumont "Underdry" Ash Gates

Features

1. **Constructed entirely of cast iron** with exception of roller track and axles.

2. **Rugged and durable.** Gate is built of 1-inch metal throughout, reinforced with heavy ribs.

3. **Gate rollers are fully enclosed** in cast iron housing which is a part of the gate plate casting, and are thus protected from water and dirt.

4. **Compression grease cups** are placed on roller axles. These cups are placed in such position that they are easily accessible and cannot be knocked or broken off.

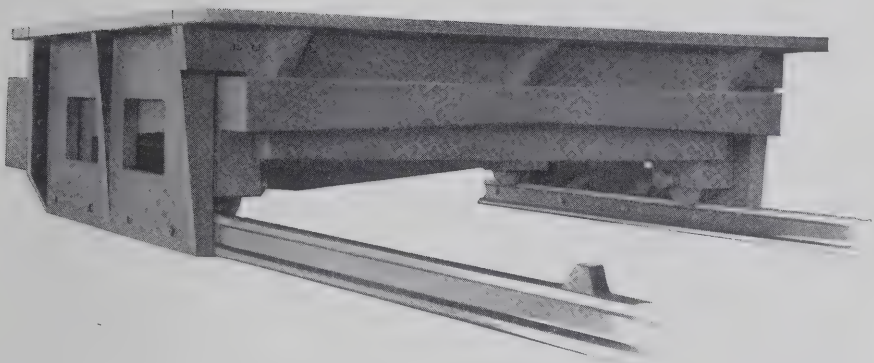
5. **Alignment of gate rollers** and vertical position of gate plate are adjustable by means of set screws placed on the roller axles. Set screws are bronze to prevent their rusting in the shafts.

6. **Gates can be arranged in "Battery"** as shown on pages 240 and 241 and it is not necessary to install a row of single gates to obtain a full hopper bottom opening. This method is compact, lessens the dead storage space in the ash hopper and is less costly.

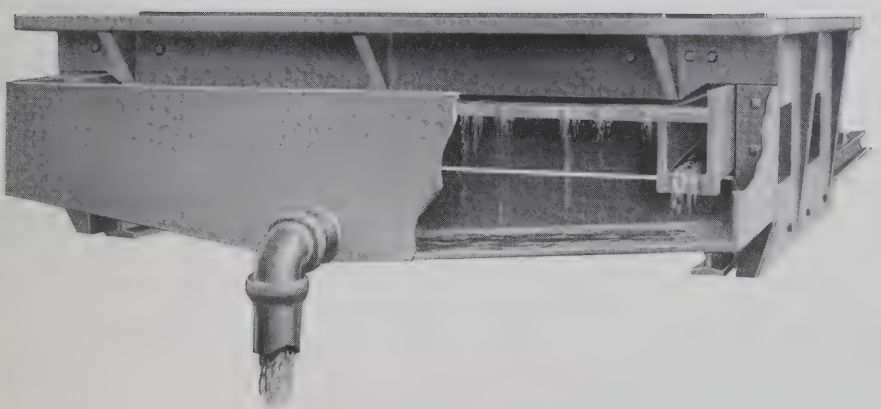
7. **Drainage,** with exception of water conductor for taking the quenching water from the rear of the gate, is entirely self contained, compact, and a part of the gate plate casting. Water troughs are of ample size and pitch to insure drainage.

8. **Axles** are very simply and securely locked in place without the use of nuts, cotters, etc.

Single "Underdry" Ash Gates

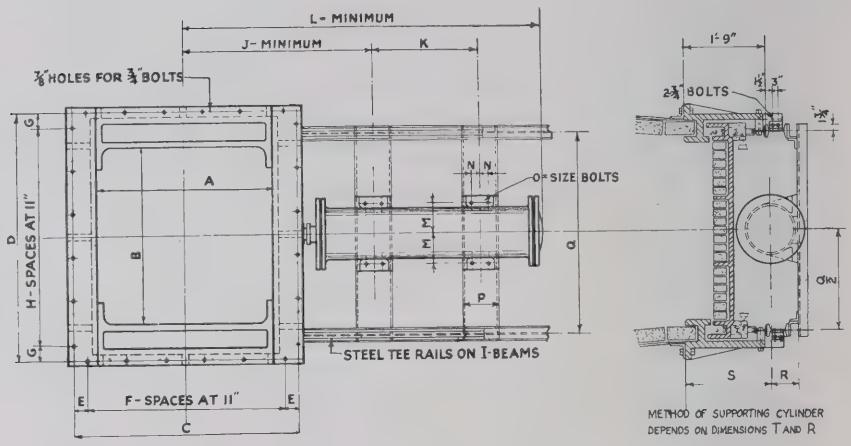


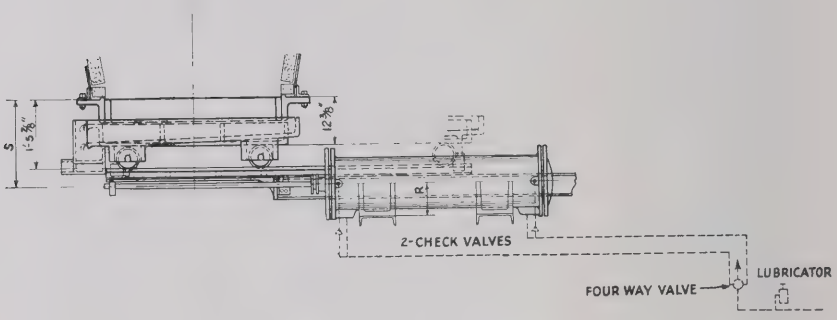
Front View of Gate, Cylinder Removed



Rear View of Gate, Showing Drainage System

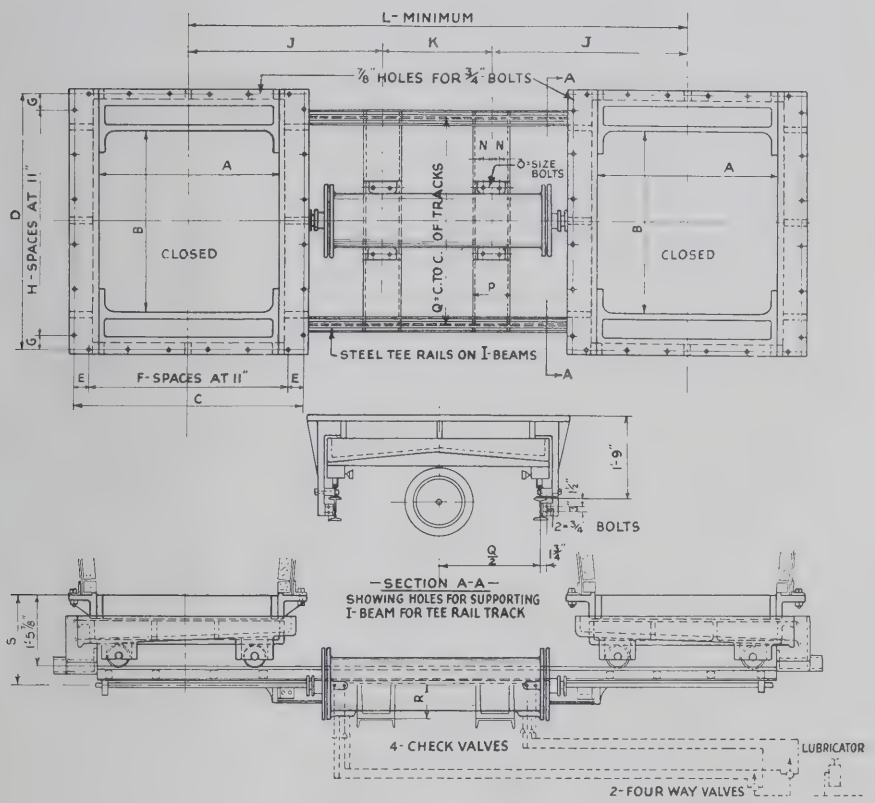
Single "Underdry" Ash Gates





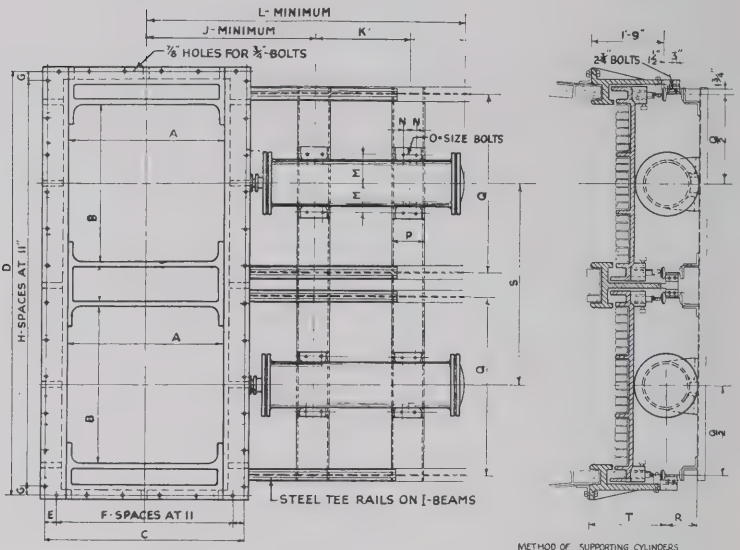
	3'-0" - STROKE		4'-0" STROKE		5'-0" STROKE		6'-0" STROKE	
A	2'-0"	3'-0"	3'-0"	4'-0"	4'-0"	5'-0"	5'-0"	6'-0"
B	4'-2⅛"	4'-2⅛"	5'-2⅛"	5'-2⅛"	6'-2⅛"	6'-2⅛"	7'-2⅛"	7'-2⅛"
C	3'-5¾"	4'-5¾"	4'-5¾"	5'-5¾"	5'-5¾"	6'-5¾"	6'-5¾"	7'-5¾"
D	3⅜"	3⅜"	3⅜"	3⅜"	4⅜"	4⅜"	4⅜"	4⅜"
E	4	4	5	5	6	6	7	7
F	4⅛"	4⅛"	4⅞"	5⅞"	5⅞"	5⅞"	5⅞"	6⅞"
G	3	4	4	5	5	6	6	7
H	3'-9½"	3'-9½"	4'-4"	4'-4"	5'-4½"	5'-4½"	5'-10½"	5'-10½"
J	1'-10"	1'-10"	2'-10"	2'-10"	3'-0"	3'-0"	3'-0"	3'-0"
K	6'-9"	6'-9"	8'-3½"	8'-3½"	9'-11½"	9'-11½"	10'-11½"	10'-11½"
L	4½"	4½"	6"	6"	8⅛"	8⅛"	8⅛"	8⅛"
M	1½"	1½"	1⅜"	1⅜"	2¼"	2¼"	2¼"	2¼"
N	⅜"	⅜"	⅞"	⅞"	1⅛"	1⅛"	1⅛"	1⅛"
O	6"	6"	8"	8"	10"	10"	10"	10"
P	2'-6"	3'-6"	3'-6"	4'-6"	4'-6"	5'-6"	5'-6"	6'-6"
Q	4"	4"	5⅝"	5⅝"	7¼"	7¼"	7¼"	7¼"
R	INS. DIA. CYLINDER 6"		9"		12"		12"	
S	1'-7½"		1'-9⅝"		1'-11¼"			

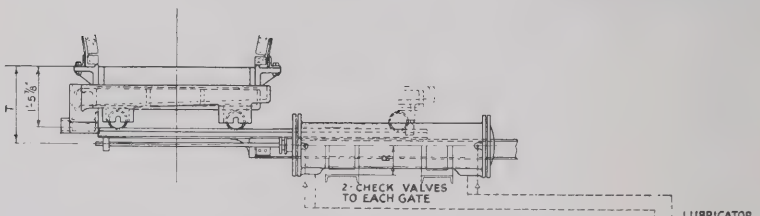
Tandem "Underdry" Ash Gates



	3'-0" STROKE		4'-0" STROKE		5'-0" STROKE		6'-0" STROKE	
A	2'-0"	3'-0"	3'-0"	4'-0"	4'-0	5'-0	5'-0	6'-0
B	4'-2 1/4"	4'-2 1/4"	5'-2 1/8"	5'-2 1/8"	6'-2 1/8	6'-2 1/8	7'-2 1/4	7'-2 1/4
C	3'-5 3/4"	4'-5 3/4	4'-5 3/8	5'-5 3/8"	5'-5 3/8	6'-5 3/8	6'-5 3/4	7'-5 3/4
D	3 3/8	3 3/8	3 3/8	3 3/8	4 3/8	4 3/8	4 3/8	4 3/8
E	4	4	5	5	6	6	7	7
F	4 3/8	4 7/8	4 1/8	5 3/8	5 3/8	5 3/8	5 3/8	6 3/8
G	3	4	4	5	5	6	6	7
H	3'-9 1/2"	3'-9 1/2"	4'-4	4'-4	5'-4 1/2	5'-4 1/2	5'-10 1/2	5'-10 1/2
J	1'-10"	1'-10"	2'-10	2'-0	3'-0	3'-0	3'-0	3'-0
K	9'-5"	9'-5"	11'-6"	11'-6"	13'-8	13'-8	14'-9	14'-9
L	4 1/2	4 1/2	6'	6'	8 1/8	8 1/8	8 1/8	8 1/8
M	1 1/2	1 1/2	1 3/4	1 3/4	2 1/4	2 1/4	2 1/4	2 1/4
N	3/4	3/4	7/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8
O	6"	6"	8"	8"	10	10	10	10
P	2'-6"	3'-6	3'-6	4'-6"	4'-6	5'-6"	5'-6	6'-6"
Q	4	4	5 3/8"	5 3/8"	7 1/4"	7 1/4	7 1/4"	7 1/4"
R	INS. DIA CYLINDER 6"		9"		12"		12"	
S	1'-7 1/2"		1'-9 1/2"		1'-11 1/4"			

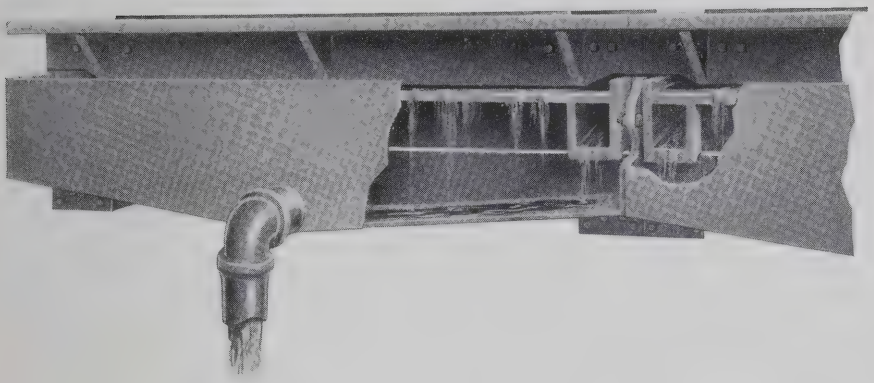
Battery "Underdry" Ash Gates





A	3'-0" STROKE		4'-0" STROKE		5'-0" STROKE		6'-0" STROKE	
B	2'-0"	3'-0"	3'-0"	4'-0"	4'-0"	5'-0"	5'-0"	6'-0"
C	4'-2⅜"	4'-2⅜"	5'-2⅜"	5'-2⅜"	6'-2⅜"	6'-2⅜"	7'-2⅜"	7'-2⅜"
D	6'-6⅜"	8'-6⅜"	8'-6⅜"	10'-6⅜"	10'-6⅜"	12'-6⅜"	12'-6⅜"	14'-6⅜"
E	3⅜"	3⅜"	3⅜"	3⅜"	4⅜"	4⅜"	4⅜"	4⅜"
F	4	4	5	5	6	6	7	7
G	6⅜"	1'-⅛"	1'-⅛"	2'-⅛"	2'-⅛"	3'-⅛"	3'-⅛"	4'-⅛"
H	6	9	9	11	11	13	13	15
J	3'-9½"	3'-9½"	4'-4"	4'-4	5'-4½"	5'-4½"	5'-10½"	5'-10½"
K	1'-10"	1'-10"	2'-10"	2'-10	3'-0"	3'-0"	3'-0"	3'-0"
L	6'-9"	6'-9"	8'-3½"	8'-3½"	9'-11½"	9'-11½"	10'-11½"	10'-11½"
M	4½"	4½"	6"	6"	8⅛"	8⅛"	8⅛"	8⅛"
N	1⅞"	1⅞"	1'-¾"	1'-¾"	2⅛"	2⅛"	2'-¼"	2'-¼"
O	¾"	¾"	⅞"	⅞"	1⅜"	1⅜"	1'-⅜"	1'-⅜"
P	6"	6"	8"	8	10	10"	10"	10"
Q	2'-6"	3'-6"	3'-6"	4'-6	4'-6"	5'-6"	5'-6"	6'-6"
R	4"	4"	5⅜"	5⅜"	7⅛"	7⅛"	7⅛"	7⅛"
S	3'-1"	4'-1"	4'-1"	5'-1"	5'-1"	6'-1"	6'-1"	7'-1"
INS DIA CYLINDER	6"		9"		12"		12"	
T	1'-7½"		1'-9½"		1'-11¼"			

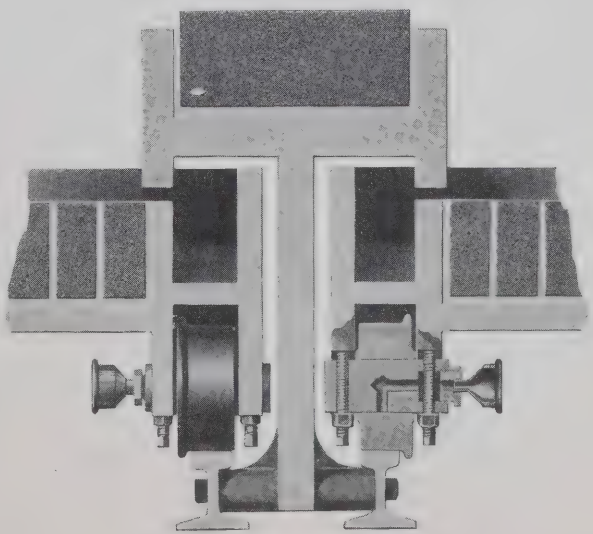
Battery "Underdry" Ash Gates



THE above photograph shows Beaumont "Underdry" Ash Gates arranged in battery. Instead of using two or more single type gates to obtain a full hopper bottom opening, a central or common web casting is used between each gate.

There is no limit to the number of gates that can be arranged in this manner. This method is compact and lessens the dead storage space in the ash hopper between gates. It is also less costly than arranging a number of single gates along the bottom of a hopper, as the weight of castings required is reduced considerably without affecting the strength and efficiency of the gates.

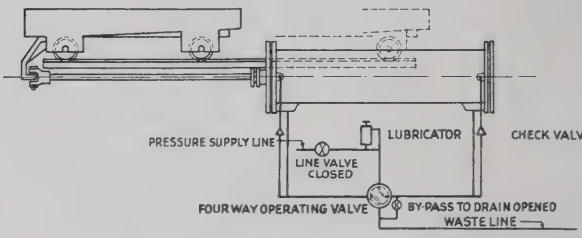
Drainage in battery gates is taken care of by the "Underdry" system shown on page 243. A common conductor for taking the quenching water from the entire ash hopper is used.



Cross section between battery gates showing details of cover over roller and method of aligning gate rollers.

Beaumont "Underdry" Ash Gates

Piping Diagrams



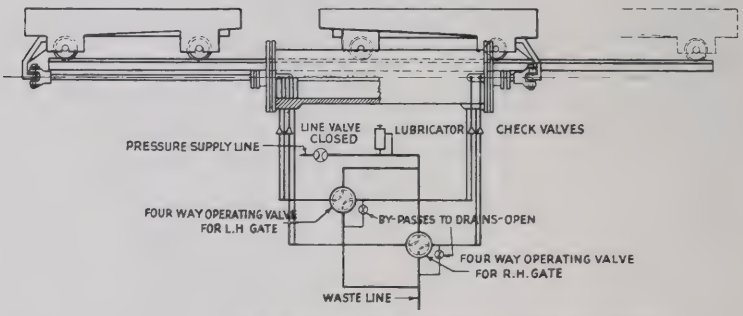
ARRANGEMENT SHOWING POSITION OF VALVES FOR DRAINING

GATE OPENING
BY-PASS VALVE CLOSED

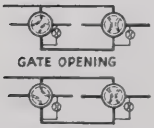
HOLDING POSITION

GATE CLOSING
BY-PASS VALVE CLOSED

FOR SINGLE GATES

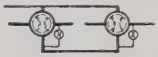


ARRANGEMENT SHOWING POSITION OF VALVES FOR DRAINING

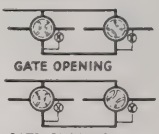


GATE OPENING

GATE CLOSING
POSITION OF VALVES TO OPERATE
L.H. GATE – BY-PASS VALVES CLOSED



BOTH VALVES IN HOLDING POSITION



GATE OPENING

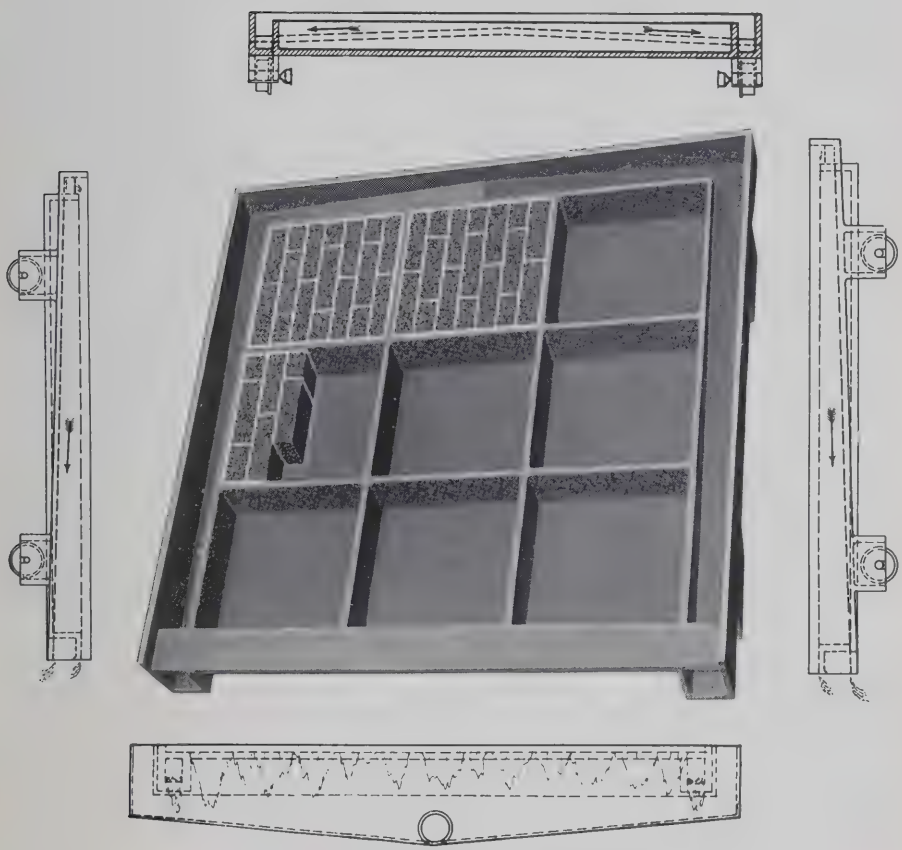
GATE CLOSING
POSITION OF VALVES TO OPERATE
R. H. GATE – BY-PASS VALVES CLOSED

FOR TANDEM GATES

CYLINDER	INLET PORTS	EXHAUST PORTS	OPERATING VALVE
6"	1"	1"	¾"
9"	1"	1"	¾"
12"	1½"	1"	1¼"

USE STANDARD THREADED PIPE AND FITTINGS THROUGHOUT
FOR BY-PASS USE ½" DIA. PIPE–SLOPE ALL PIPES FOR PROPER DRAIN
PROTECT CYLINDER AND PIPING WITH SUITABLE INSULATION WHEN USED IN EXPOSED LOCATIONS AND PLACE DRAIN AND OPERATING VALVES WHERE FREEZING IS IMPOSSIBLE

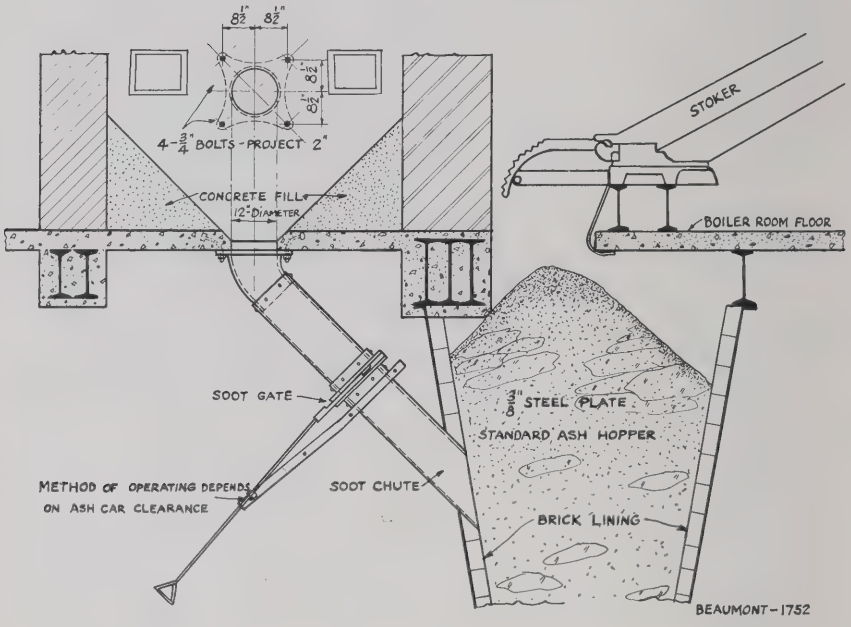
"Underdry"



THE above shows clearly the drainage system on Beaumont "Underdry" Ash Gates. This system, with the exception of the water conductor for taking the quenching water from the rear of the gate, is entirely self-contained and cast as a part of the gate plate casting. The water troughs are amply large enough to take all quenching water coming from the hopper and are arranged with sufficient pitch to insure rapid and perfect drainage of all water as well as any fine particles of ash that might be washed into the troughs. At the rear of the gate the quenching water is carried over the cutting edge of the gate plate into the water conductor.

A battery of "Underdry" gates is drained in the same manner as explained above, a common conductor at the rear of the gates taking off the water. This is plainly shown on pages 240 and 241.

Beaumont Soot Chutes and Gates



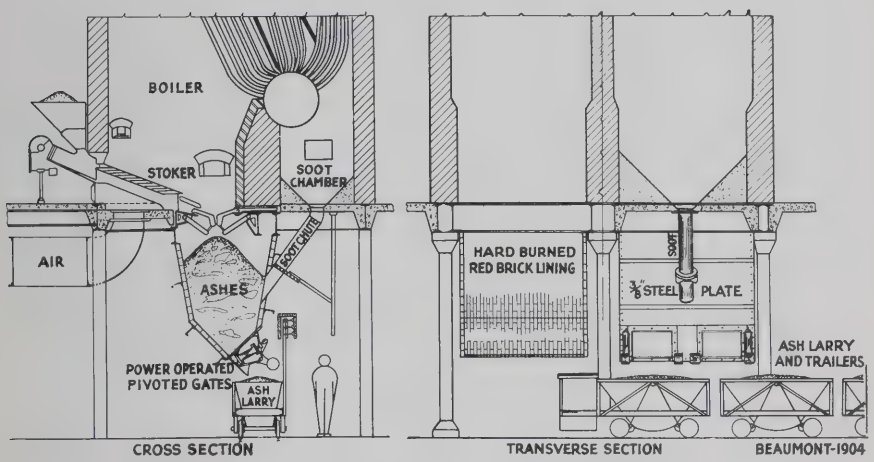
Standard Layout

SOOT chutes are 12 inches inside diameter and built of 3/16-inch steel plate. They are attached to cast iron pipe flanges bolted to underside of floor of soot chamber. Bolt setting is shown in sketch above.

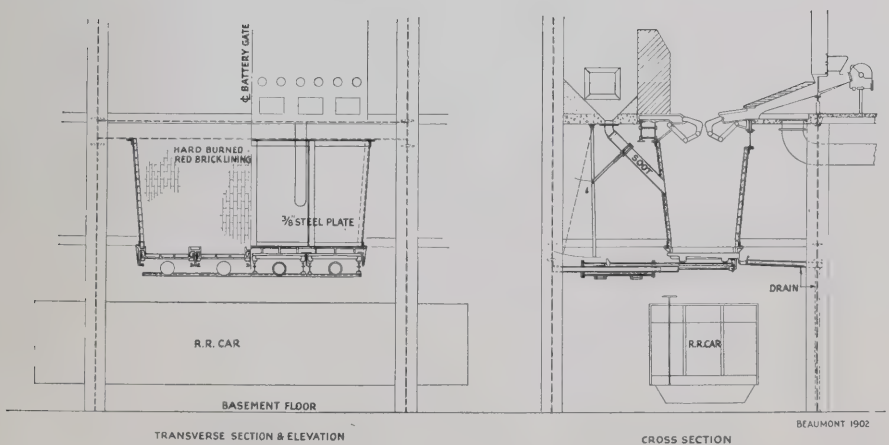
Soot chamber is built with concrete fill in the corners to assist the flow of soot to the chutes. The number of chutes required depends upon the width of the boiler. Chutes are usually spaced 5 feet apart.

Soot gate consists of a cast iron gate slide operating in cast iron guides and effectually cuts off any back draft into boiler. Gates are operated either by pull rod or by lever, depending on ash car clearances.

Beaumont Ash Hoppers



Gravity Discharge Ash Hoppers and Power Operated Pivoted Gates



Bottom Discharge Ash Hoppers and Power Operated "Underdry" Gates

Engineering Data

Boiler House Design

Basic Facts Concerning Coal and Ashes

BOILERS are nearly always operated to get a horsepower output above their rating. At the same time, the load factor, which is the ratio of the steam actually consumed to the steam which could be produced in the entire boiler house, affects the gross plant output. This load factor is generally kept low without loss of efficiency by the cutting out of some of the boilers. All boiler houses should be built with an excess number of boilers to allow cutting out some for repairs, and also with space reserved for future additional boilers to allow for larger future demands.

We will assume that boilers are generally run at about 150 per cent of rating and that load factor is about 67 per cent. This is equivalent to 100 per cent rating at 100 per cent load factor.

We will also assume that coal consumption is 3½ pounds per boiler horsepower per hour. For one battery consisting of two 500 H.P. boilers or 1000 boiler horsepower, the coal consumption would be 1000 x 3½ pounds, or 3500 pounds, or 1¾ net tons per hour.

The skip hoist, or other means that may be handling the coal, should have a capacity per hour of about six times the consumption per hour, so that the coal ordinarily need be handled only during about one-half of the eight-hour day shift. This would give a capacity of 10½ net tons per hour per 1000 boiler horsepower. This gives a reserve for slower unloading under winter conditions.

The coal bunker should hold at least twenty-four hours' supply and in important plants this should be increased to forty-eight hours' supply or coal handling facilities should be in two distinct and separate units to insure operation, even if one unit should break down. The minimum coal bunker should, therefore, be twenty-four times 1¾ tons or forty-two net tons capacity per 1000 boiler horsepower. Additional reserve storage should be on ground outside of boiler house.

The larry should have a minimum capacity in tons per hour of about three times the boiler consumption or 5¼ net tons per 1000

boiler horsepower. This will enable the larry operator to attend to other duties during two-thirds of his time.

Stoker hoppers should be as large as practical to save work by the larry. Best practice is to have each stoker hopper hold about three hours' boiler supply. Generally the conditions imposed will not permit a hopper this large.

Ash production will vary very much according to the kind of coal used. It may be as low as 10 per cent with eastern bituminous or up to 20 per cent with lower-grade western bituminous and buckwheat anthracite, and may run as high as 60 per cent with low-grade coal such as river coal, etc. We were advised at one plant using this low-grade river anthracite that, bulk for bulk, they produced as many cubic feet of ashes as they burned cubic feet of coal. Care should, therefore, always be taken with plants burning such coal that ash skips, bunkers, etc., are amply large.

Ashes are cleaned out intermittently, and the time during which the ashes are taken out of the hoppers under the boilers is in inverse ratio to the capacity of the hoppers. For example, if the ash hopper capacity is assumed at over sixteen hours' production, all cleaning out should be done in the one shift of eight hours. If capacity of hoppers is only eight hours' production, then ashes must be taken out during two shifts of eight hours each.

We advise that capacity of ash hoppers be between sixteen and twenty hours' production, or so that ash handling is necessary only during the day shift. The men cannot be assumed as actually cleaning out ashes during the full eight-hour shift, a fair assumption being that they will work at cleaning out the ashes for six hours, the balance of their time being occupied by other duties. The ash handling capacity, therefore, should be ample to carry twenty-four hours' production in six hours.

If we assume that ash produced is 12½ per cent of the coal consumed it would be 12½ per cent of 42 tons, or about 5¼ tons per day per 1000 boiler horsepower. This would give .87 to 1.3 net tons per hour per 1000 boiler horsepower when four to six hours are allowed for the removal of the ashes.

The car system provided for the removal of the ashes from the hoppers and the ash skip hoist should have at least this capacity.

In cases where it is desired to handle the ashes during two or all three eight-hour shifts, the hopper capacity and car and skip capacity can be one-half or one-third of that derived above. In the design of new boiler houses, the reduced height of an eight- or ten-hour hopper over sixteen- to twenty-hour hopper may save enough building cost, due to reduced height of building, to warrant using the smaller hopper even though it increases the labor cost of removing ashes.

Ashes can generally be removed from an ash bunker satisfactorily only in daylight or during one eight-hour shift. Therefore, ash bunker capacity should be such as to hold all ashes produced during the other sixteen hours plus a fair margin. We advise that ash bunker should hold at least twenty hours' production or 4.4 net tons or 220 cubic feet per 1000 boiler horsepower if coal produces 12½ per cent ash. The minimum capacity of an ash bunker should generally be one carload of 40 to 80 net tons or 2000 to 4000 cubic feet.

In conclusion, it is well to state that coal and ash handling systems, bunkers, etc., should, when possible, be designed with as large a capacity as practical. Larger capacities generally mean reduced labor costs as men have more spare time for other duties.

Summary

Capacity per 1000 Rated Boiler Horsepower

Coal Consumption . . .	1¾ tons per hour
Coal Skip Hoist	10½ tons per hour
Crusher	10½ tons per hour
Coal Bunker	42 tons (24 hours' supply) minimum
Larry Capacity	5¼ tons per hour
Stoker Hoppers	5¼-ton hopper on a 1000 H.P. boiler —other sizes in proportion
Ash Hoppers.	3.5 to 4.4 tons on a 1000 H.P. boiler —other sizes in proportion
Ash Cars.	.88 to 1.3 tons per hour
Ash Skip Hoist.	.88 to 1.3 tons per hour
Ash Bunker	5 tons (50-ton minimum bunker)

Engineering Data

THE table below is based on capacity of coal and ash skip hoists in tons per hour being six times the consumption of coal or production of ashes, or in other words with skips running only four hours per day of twenty-four hours.

Advisable Capacities of Coal and Ash Skips, Bunkers and Larries for Various Size Boiler Houses

Rated Boiler Horse Power	Consumption of Coal in T.P.H.	*Production of Ashes in T.P.H.	Capacity Coal Skip in T.P.H.	*Capacity Ash Skip in T.P.H.	Capacity 24 Hours Coal Bunker Tons	*Capacity Ash Bunker Tons	Capacity Larry in T.P.H.
1,000	1.75	.22	40	Ashes and Coal both handled in one Skip	50	50	6
1,500	2.63	.33	40		70	50	8
2,000	3.5	.44	40		90	50	11
3,000	5.25	.66	40	10	130	50	16
4,000	7.0	.88	50	10	175	50	21
6,000	10.5	1.2	70	10	275	50	32
8,000	14	1.8	90	15	350	50	42
10,000	17.5	2.2	110	15	425	50	53
15,000	26.3	3.3	160	20	650	70	80
20,000	35	4.4	225	25	850	90	105
25,000	43.8	5.5	275	30	1,100	120	135
30,000	52.5	6.6	325	40	1,300	140	170

*Ash production is based on ash being 12½ per cent of coal by weight.

Engineering Data

Capacity of Skip Hoists

For Balanced Skips Multiply by 2

Formulas assume 50 lbs. per cubic foot for Coal
Formulas assume 40 lbs. per cubic foot for Ashes

Feet per Minute	Ash Manual Loading	Ash Simplex Loader	Ash Apron Feeder Loader	Coal Manual Loading	Coal Simplex Loader	Coal Apron Feeder Loader
75	$\frac{38C}{H+30}$	$\frac{38C^1}{H+12.5}$	$\frac{38C}{H+6.25+\frac{C}{6.4}}$	$\frac{48C}{H+30}$	$\frac{48C^1}{H+12.5}$	$\frac{48C}{H+6.25+\frac{C}{6.4}}$
125	$\frac{64C}{H+50}$	$\frac{64C^1}{H+21}$	$\frac{64C}{H+10.5+\frac{C}{3.8}}$	$\frac{80C}{H+50}$	$\frac{80C^1}{H+21}$	$\frac{80C}{H+10.5+\frac{C}{3.8}}$
234	$\frac{120C}{H+116}$	$\frac{120C^1}{H+50}$	$\frac{120C}{H+40+\frac{C}{2.05}}$	$\frac{150C}{H+116}$	$\frac{150C^1}{H+50}$	$\frac{150C}{H+40+\frac{C}{2.05}}$
250	$\frac{127C}{H+140}$	$\frac{127C^1}{H+60}$	$\frac{127C}{H+41+\frac{C}{1.9}}$	$\frac{160C}{H+140}$	$\frac{160C^1}{H+60}$	$\frac{160C}{H+41+\frac{C}{1.9}}$

Horsepower of Coal and Ashes Skip Hoists

Formulas assume 50 lbs. per cubic foot for either Coal or Ashes

Feet per Minute	No Counterweight		Counterweighted		Balanced	
	Manual Loading	Simplex Loader	Manual Loading	Simplex Loader	Manual Loading	Simplex Loader
75	$\frac{C}{3.2}$	$\frac{C}{2.7}$	$\frac{C}{8}$	$\frac{C}{7.4}$	$\frac{C}{4.8}$	$\frac{C}{4.6}$
125	$\frac{C}{1.92}$	$\frac{C}{1.6}$	$\frac{C}{4.8}$	$\frac{C}{4.46}$	$\frac{C}{2.9}$	$\frac{C}{2.76}$
234	$\frac{C}{1.02}$	$\frac{C}{.87}$	$\frac{C}{2.56}$	$\frac{C}{2.4}$	$\frac{C}{1.55}$	$\frac{C}{1.48}$
250	$\frac{C}{.96}$	$\frac{C}{.81}$	$\frac{C}{2.4}$	$\frac{C}{2.23}$	$\frac{C}{1.45}$	$\frac{C}{1.38}$

C = Water Capacity of Skip Bucket in cubic feet.
C^1 = Carrying Capacity of Skip Bucket in cubic feet. See page 43.
H = Total Lift of Skip Bucket in feet.
Use nearest motor to these results but not smaller than 5 per cent less than result.

Angle of Chutes, Etc.

Chutes (and gates) cause more trouble in handling materials than do conveyors. They should therefore be laid out with care, following this table, which is based on our standard practice and numerous recognized authorities.

			Dammed		Flowing			Angle of Repose		Weight per Cubic Foot
			Round Chute	Rectangular Chute	Round Chute	Rectangular Chute	† Hoppers			
COAL	R. O. M. Bituminous	Minimum	...	...	...	...	35°	Min.	35°	50 lbs.
		Standard	50°	45°	45°	40°	40°	Max.	45°	
	Crushed Bituminous	Minimum	...	45°	...	...	35°	Min.	35°	50 lbs.
		Standard	50°	45°	45°	40°	40°	Max.	45°	
	Domestic Anthracite	Minimum	35°	30°	30°	25°	25°	Min.	27°	53 lbs.
		Standard	40°	35°	35°	30°	30°	Max.	30°	
	Steam Anthracite	Minimum	...	45°	...	...	35°	Min.	35°	60 lbs.
		Standard	50°	45°	45°	40°	40°	Max.	45°	
COKE	Pea or Breeze *	Minimum	40°	35°	35°	30°	30°	Min.	40°	37 lbs.
		Standard	45°	40°	40°	35°	35°	Max.	50°	
	Nut and Larger	Minimum	35°	30°	30°	25°	25°	Min.	40°	30 lbs.
		Standard	40°	35°	35°	30°	30°	Max.	50°	
	Ashes	Minimum	...	...	...	45°	40°	Min.	35°	40 dry
		Standard	55°	50°	50°	45°	45°	Max.	45°	50 wet

NOTE: Use minimum angle of repose to determine height of sides of hoppers, bunkers, etc., to prevent the material overflowing the bunker. Use maximum angle to determine capacity. Use mean value for all other cases.

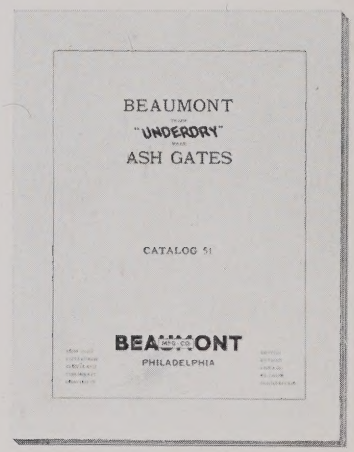
† For hoppers use the minimum angle for valley angle.
* When possible make chute 10° steeper.
In right angle chutes, make final chute 5° steeper, thus:

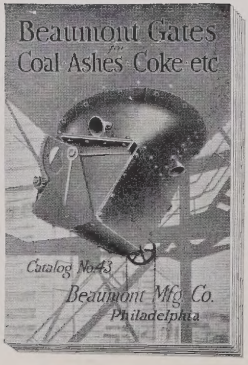
Size of Round Chutes

The proper diameter of chute depends on the size of the material to be handled. The following table gives the correct size of chute to use for the materials given above.

Coal R. O. M. Bituminous	20″
Coal—Crushed Bituminous	12″
Coal—Anthracite—Small Domestic	8″
Coal—Anthracite—Large Domestic	12″
Coal—Anthracite—Steam Sizes	16″
Coke—Breeze	12″
Coke—Broken	20″
Coke—Run of Oven	24″
Ashes—Fine	16″
Ashes—With Clinkers	24″

Other Beaumont Catalogs





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